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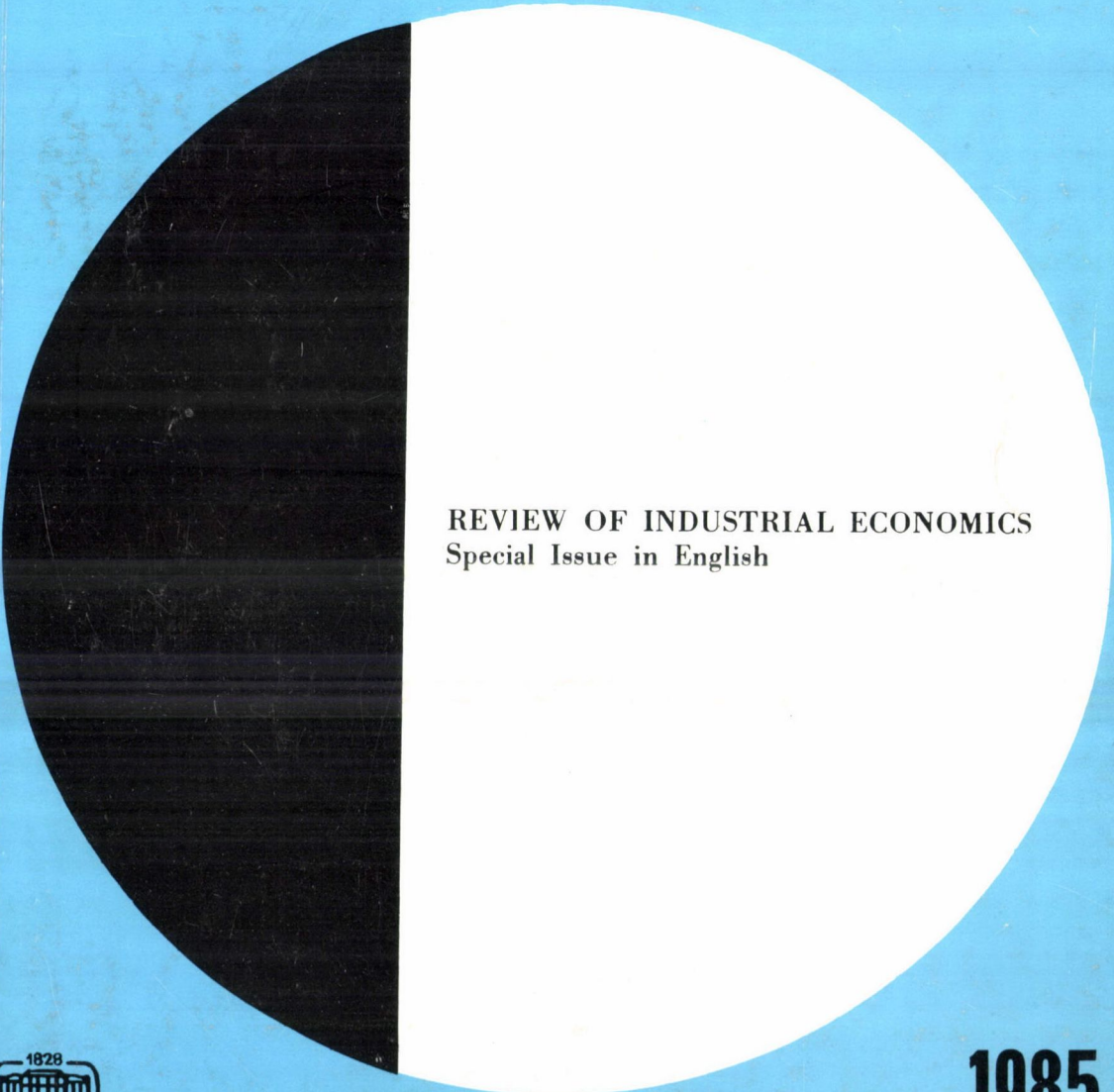
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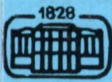
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REVIEW OF INDUSTRIAL ECONOMICS
Special Issue in English



1985

IPARGAZDASÁGI SZEMLE

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MAGYAR
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KÖNYVTÁRA

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PREFACE

Ipargazdasági Szemle (Review of Industrial Economics) is a quarterly publication of the Research Institute of Industrial Economics of the Hungarian Academy of Sciences. The copy the reader now holds is a special English issue of this periodical, carrying articles by the fellows of the Institute. We intend to publish such special issues in English in the future regularly. Here we are going to present the Institute briefly.

The Hungarian Academy of Sciences has two aspects and functions. On the one hand, it is the elected body of outstanding Hungarian and foreign scholars (the latter as honorary members). With its ten scientific departments and a great many scientific commissions it is the highest democratic forum of Hungarian scientific life. On the other hand, the Academy is the supervisory authority of 36 research institutes working in the most diverse fields, pursuing mainly basic research.

The Academy maintains three economic institutes, the Research Institute of Industrial Economics (RIIE) is one of them. (There is also an Institute of Economics and an Institute for World Economics.) RIIE was established in 1960. Its initiator, and first director, academician Gyula *Hevesi*, beside his earlier functions, had been vice-chairman of the Academy between 1960-1967. The objective set for the Institute was to pioneer with not too many, yet exemplary, research projects in its area of competence, and further the scientific foundation of industrial development. The director's office was taken by Zoltán *Román* in 1968.

The basic task of the Institute is formulated in its statutes as follows: "The task of the Institute is to carry on research of general interest into industrial economics, stimulate and help to coordinate industrial economic research, promote the development of scientific and practical industrial economic activity." Accordingly, the Institute has served, beside its own researches, the general development of its discipline with its coordinating and stimulating activity, mediating between theory and practice, among other things through helping the activities of the Commission of Industrial Economics of the Hungarian Academy of Sciences.

At first, the research of the Institute dealt with working time schedules, utilization and management of fixed assets, development of technology and products. Later on the scope of subjects expanded and the points of emphasis changed in line with demand. Since the early sixties the research has been centred on productivity and efficiency. For long years the Institute had been the Hungarian coordinator of the Productivity Working Group of the CMEA and since 1969 it has been the Hungarian member of the European Association of National Productivity Centres. (The manager of the Institute was vice chairman of the Federation, between 1972-1975 its chairman and since 1983 again its vice chairman.)

The Institute participates in the medium and long-term planning of industrial development regularly, and has conducted several research projects on corporate and sectoral planning, its practical experience and the links between corporate and

macroeconomic planning. After the introduction of the new system of economic control and management in 1968 the subjects to be investigated expanded to include enterprise behaviour and the problems of enterprise (managerial) economics corresponding to the new conditions. Since the mid-sixties industrial development and industrial policy, and lately industrial organization and the problems of management have obtained emphasis in its work program.

The Institute has placed great weight on interdisciplinary approach and empirical investigations from the very start. In the scope of the latter it was particularly the surveys relating to enterprise behaviour and intentions, problems difficult to investigate with traditional statistical instruments, (e. g. factors of productivity, judgement of technological progress, conditions of market competition) that have become known and generally quoted sources.

The Institute maintains wide international contacts with related institutes in both East and West, as well as with international organizations (ECE, UNIDO, European Association of National Productivity Centres, CMEA-institutes, IIASA, etc.). It organizes international symposia, seminars, conferences regularly. The papers of two such conferences were also published in English:

Progress and Planning in Industry. Akadémiai Kiadó, Budapest 1972.

Industrial Development and Industrial Policy. Akadémiai Kiadó, Budapest 1979.

The following titles of books, published in Hungarian on the basis of research carried out in the Institute give a picture about its activity.

Hevesi, Gy.: Economic, Organizational and Social Problems of Continuous Working Time Schedules. (1966)

Topical Problems of the Management of Fixed Assets – Conference Papers. (1968)

Kéri, T.: Flexibility of the Industrial Firm. (1972)

Botos, B.: Reckoning with Uncertainty in Investment Decisions of Industrial Enterprises. (1973)

Parányi, Gy. (ed.): A Rapid Method for Disclosing Organizational Tasks. (1975)

Viszt, E.: Occupational Mobility of Labour. (1975)

Román, Z.: Productivity and Growth. (1982)

Parányi, Gy.: Organization of Work – Organized Work. The Workplace-Centred Development of Organization. (1977)

Botos, B.–Papanek, G.: Investigation of the Profitability in Industry. (1977)

Román, Z.: The Economics of Industry. (1978)

Mrs. Ványai, P.: Factors Influencing the Performance of Workers. (1978)

Sternthal, J.: Production Cooperation in the Engineering Industry. (1979)

Román, Z.: Industrial Policy. (1981)

Botos, B.–Papanek, G.: Development of the Production Structure of Industry. (1982)

Parányi, Gy.: The Modernizing Development of Industrial Production. (1983)

Botos, B.–Papanek, G.: Question Marks in the Development of the Hungarian Industry. (1984)

Bagó, E.: Diversification in the Industry. (1985)

Hoványi, G.: Models of Management. (1982)

Papanek, G. (ed.): Medium-Term Planning in the Hungarian Industrial Enterprises (forthcoming).

INDUSTRIAL ORGANIZATION IN HUNGARY

ZOLTÁN ROMÁN

The notion of industrial organization denotes, on the one hand, a discipline of economics, having come about under this name in the United States in the thirties, but reaching back to the book by Alfred *Marshall* (*The Economics of Industry*, 1879) and in the Western world it is frequently called by this name even today. Industrial economics came into being at about the same time in the Soviet Union, on a different foundation, and to a considerable extent with different content. The first large All-Union Conference was held under this title in 1929, and the first textbook (by J. A. *Granowski* and D. L. *Markus*) was published in Moscow in 1940. I analysed the further development of the two schools in another paper,¹ together with their similarities and differences, thus I will not delve into this.

At the same time, the notion of industrial organization denotes, on the other hand, the system of operation and relations of the organizations carrying on industrial activity as well as of those shaping, controlling, influencing and representing them. I believe it is essential to distinguish, in this approach, between two subsystems of the industrial organization: 1. the subsystem realizing industrial production, the main elements of which are the establishments, the enterprises and other business organizations, further, 2. the subsystem of institutions shaping, controlling, influencing and representing industrial activities. In centrally planned economies, where the overwhelming part of industrial output is contributed by state-owned enterprises, this distinction is indispensable for understanding the system and the operation of industry. It is, however, no less important today in the market economies, too, partially because of the not negligible weight of the state-owned enterprises, and much more because of the growing role there of the second subsystem. (I refer here not only to governmental organizations but also to employer organizations, trade unions and other local or national institutions.)

The relationship between these two subsystems of the industrial organization is determined by the system and practice of economic control and management. We aim to establish such relationships between the two which promote the functioning of the whole system with the best possible efficiency. Concerning the development of the system of economic control and management itself, industrial organization is partly a *precondition* determining the initial situation and in many respects the pace of further steps to be taken, and partly the shaping of the organizational system is a *possibility*, a *tool*, for improving economic control, and thus for realizing the *comprehensive* goals of economic and industrial policy.

¹L'Economia industriale all'Est ed all'Ovest. *Rivista di Economia e Politica Industriale*, 1978. 1.

For the shaping of the structure of industrial organization, above all of the productive organizations, there are direct and indirect instruments available. Direct instruments are, e.g., the creation and liquidation of industrial establishments, enterprises or other business organizations, the rearrangement of their scope of activity or authority, or of their mutual relations. Indirect instruments are, e.g., such modifications of the system of economic control and management which influence the situation, survival, mutual relations of organizations and prompt some of the units to change, on their own initiative, the way how they fit better into the organizational system. Increasing interference into these processes in the capitalist countries derives from the recognition that the market does not properly regulate them; in the socialist countries, however, these processes are from the outset – and to an exaggerated extent – exempted from market impulses, and indirect methods are seldom used.

The industrial organization, and both of its subsystems, are most strongly influenced by the division of labour, specialization and cooperation, as well as by some general laws of organizational life.

The mutually interrelated forms of the division of labour, specialization and cooperation, appear in every area of human activity and are particularly important in the spheres of production and administration. The division of labour provides the foundation for specialization, demanding simultaneously also cooperation. The division of labour and specialization render large-scale production and activity possible and this results in a more advantageous distribution of both stock and flow inputs, in so-called economies of scale. It is, however, no less important that in the case of specialization, more specialized knowledge, software and hardware and a more complete and safer background can be provided for a narrower field than if many kinds of tasks have to be completed at the same time.

The division of labour and specialization necessarily involve cooperation and this brings about mutual dependence. This dependence, the extent of mutuality and its judgement, may differ. All that also entails a growing social nature of production, and in production it is accompanied by a further general phenomenon: i.e. concentration.

From among the general characteristics of the life of organizations the most important is that, besides the targets set to the organizations, they have themselves their own targets. These are survival and growth on the one hand, and helping the members (the majority of members) in realizing their individual and group objectives. The individual and group objectives partially meet and partially conflict; the objectives of the organization are formulated as a compromise. Identification with objectives *set to* the organization may be of a varying degree, mostly compromises are needed also in this respect.

Every organization has not only own objectives, but also instruments for asserting them. From among them the greatest role is accorded in industrial organizations to the handling of information and the regulation (tactics) of performance. The individual organizations transmit information about themselves, about the phenomena known by them applying a certain selectivity – conforming to their interests. With this, state-owned enterprises may e.g. considerably influence what tasks are considered by higher bodies as such that can be performed by them and thus are set to them, how

these bodies decide on investments, development directions and subsidies. The regulation of performance (tactics, reserve building) are everyday phenomena, particularly reinforced if a) the market is not given a serious role in assessing performances, and b) if the latter are compared in the first place to the "base data", attained in the preceding period, and not to national or international standards.

The basis of the theory of industrial organization worked out for market economies is the paradigm structure – behaviour – performance. In many respects, this is also relevant for centrally planned economies, though it requires adaptation and expansion. This is similar to the fact – only in greater extent – that the theory originally worked out for the American economy had to be also adapted to the European environment² and further developed in order to be suited for the explanation of newer phenomena.

International Tendencies and the Hungarian Efforts

The Hungarian reform of economic control and management of 1968 was started, among other things, by the recognition that there are significant conflicts of interest between the enterprises and the central control of the economy and these cannot be overbridged with the aid of the usual mechanisms of planning, breaking down the plans, and stimulation for plan fulfilment. It was a further recognition (already in the seventies) that even the national economic interest cannot always be exactly defined. The independent organizational and individual interests appear not only in the enterprise sphere but also in the control sphere. This is why efforts are made to work out such mechanisms which do not disguise but bring to the surface, open and oppose these interests, thus trying to assert finally the common interest.

It could be clearly seen already during the preparation of the reform that the elimination of plan-instructions and the increasing role of the market would demand significant changes in industrial organization, both in the relationship between enterprises and the control agencies and in their *structure*, also separately. Only in this manner would their *behaviour* become different and serve *greater performance*. The document laying the foundations for reform denoted the desirable directions for the development of the organizational pattern of enterprises rather unambiguously and correctly – even in hindsight – (closer relations between production and sales, appropriate proportions between small, medium and large enterprises, etc.), but, for tactical reasons, it did not provide for direct practical steps. The role of the control agencies, and changes therein were indicated in the principles of the reform but in major outlines.

As is known, the implementation of the reform has not been unbroken, beginning with the second third of the seventies the old role of the control agencies has been revitalized, and centralization of the enterprise organization continued. With the change in economic policy, in 1978 a new growth path was marked out for the

²Jacquimin, A. P.–Jong, H. W. de: *European Industrial Organization*. The Macmillan Press Ltd., London and Basingstoke 1977. 269 p.

Hungarian economy: while slowing down the rate of growth, the improvement of external economic equilibrium was put at the centre and a stand was taken for a resolute continuation of the reform process. Enterprise centralization was stopped by the government in 1980 and, beside other reform measures, steps were taken to reverse it. In April 1984 a new resolution was taken for the continuation of the reform and, within it, for essential modifications in industrial organization.

The Hungarian economic reform is searching for the particular new methods of socialist economic control and management, endeavouring to develop its new system. Understandably, this is a longer *learning process*, for which no ready-made historical examples are available, but international experience may serve with important lessons.

I think that the following are the most important international tendencies in the development of industrial organization:

1. specialization, cooperation and (in certain areas and to a certain extent) the growth of concentration;
2. integration of research, production and marketing;
3. internationalization;
4. growing government interference (with opposite waves and exceptions);
5. spreading of industrial democracy, of various forms of participation;
6. efforts to strengthen social control over the large corporations and government administrations;
7. consolidation of the role of small and medium-sized firms; and, in the large corporations:
8. separation of ownership from management;
9. the establishment of internal profit and cost centres; spreading of the "divisional" organization;
10. diversification;
11. experiments with intrapreneurial ventures;
12. the gaining ground of the "shadow economy".

The place is insufficient here – however interesting it might be – to trace these tendencies historically and by countries (groups of countries) in all detail. I will only illustrate with a few remarks the fact that their majority can be found in both the capitalist and the socialist countries, at times with a time lag and, of course, with not negligible differences. Thus e.g., as already mentioned, growing specialization, cooperation and concentration are common tendencies (1). While, however, concentration (and particularly organizational centralization) was highly developed in the socialist countries, specialization and, particularly, cooperation is frequently faltering; the role of small and medium-sized firms (7) was belittled and this view is only now beginning to change. Internationalization (3) is of a lower degree in the socialist countries, even within the CMEA. Research, production and marketing were earlier sharply separated, the situation has improved in Hungary after the reform, in other countries improvement has only started in recent years (2).

The building out of internal profit and cost centres (economic accounting within the enterprise) is a common effort (9). Partly owing to identical causes (more leisure time in consequence of reduced worktime, demand for additional income), the scope of the second, the shadow economy is growing in both groups of countries (12).

Diversification of production may be observed in the industrial firms of the socialist countries, too, but rather in the interest of eliminating the obstacles to cooperation and not on grounds of deliberate business policy considerations as is the case with capitalist firms (10). The role of industrial democracy, of various forms of participation is growing in both groups of countries (5) – if under different conditions, and with different roles. Experiments with intrapreneurial forms (11) are linked to market and profit orientation in the capitalist countries: presumably, they will be of importance under similar conditions also in the socialist countries.

The problem of relationship between ownership and management (8), as well as the forms and extent of government interference (4) would demand a deeper analysis; comparison in a few sentences would be highly risky. The demand of social control over large enterprises (6) can be tracked back in the capitalist countries at least to a hundred years, in the socialist countries we cannot speak about such general efforts. Also the problem of control over the agencies of government administration appears in a different context, linked to the basic problems of political democracy.

It should be clear from the above that the greater part of these tendencies may also be found in the industrial organization in Hungary (several of these are deliberate new efforts after the 1968 reform), together with such consequences of earlier principles and interferences which we now judge as irrational and to be corrected, (in themselves, but particularly from the viewpoint of the 1968 reform). Therefore, in shaping the Hungarian industrial organization, *three efforts have to be amalgamated*: a) correction of earlier created unhealthy structures; b) promotion of international tendencies that seem to be followed; and c) experimentation with and introduction of *original, new* solutions corresponding to the conditions of the Hungarian economy.

Major Characteristics of the Pattern of Establishments and Enterprises in the Hungarian Industry

According to 1983 data (see *Table 1*) there were 715 enterprises and 4579 establishments in the state-owned industry and in the cooperative industry the corresponding figures were 622 cooperatives and 4315 establishments. This was complemented by the activity of 44177 private artisans and about 10000 other small-scale organizations. But *Table 1* only comprises the data of organizations classified as industrial ones. In the last 10 years industrial output has also grown in the non-industrial organizations and their output already exceeds 10 percent of that of the total "socialist" (i.e. state-owned and cooperative) industrial organizations, their employment 12 percent of that in the socialist industry. (As a matter of fact, they, too, belong to the socialist sector, but are not classified by statistics as "socialist industry".) A considerable part of industrial activity pursued here is linked to the main activity of the given organization. Thus in state farms and agricultural cooperatives food processing is decisive, in building organizations the production of building materials, but we also find considerable engineering, chemical, light industrial and other industrial activities and services which are rather far from the basic activity of the organization in question.

Major data of the productive organizations of industry

	1970	1975	1980	1983
	Number of enterprises and establishments, 31st Dec.			
Number of enterprises in the state-owned industry	812	779	699	715
Of which: in the industry supervised by ministries	532	543	546	564
in the industry supervised by the (local) councils	280	236	153	151
Number of establishments of the enterprises of which: in the industry supervised by ministries	5681	5387	4991	4579
in the industry supervised by (local) councils	3066	3170	3355	3089
Number of cooperatives	2615	2217	1636	1490
Number of private artisans (active and continuing working in retirement)	821	793	661	623
Small firms and small cooperatives	43054	35677	39275	44177
Workteams in cooperatives	—	—	—	286
Intrapreneurial groups	—	—	—	436
Partnerships	—	—	—	5111
Average number of employees	Average number of employees, 1000 persons a)			
State-owned industry	1491	1505	1392	1286
of which: supervised by ministries	1339	1368	1295	1196
supervised by (local) councils	152	137	97	90
Cooperative industry	238	239	222	202
Private artisans	61	47	46	52
Small firms and small cooperatives	—	—	—	18
Workteams in cooperatives	—	—	—	13 ^{b)}
Intrapreneurial groups	—	—	—	54 ^{c)}
Partnerships	—	—	—	8 ^{b)}

a) Up to 1975: inclusive of apprentices, b) Work done partly as part time job, c) Part-time jobs.

About one third of the industrial sales of non-industrial organizations derive from food processing, a further two fifths from building materials production. There is hardly any agricultural establishment (about 10 percent) without industrial activities. Their share in total sales receipts is 21-22 percent on average, but while in one third of them this does not exceed 10 percent, in a small group (mainly in cooperatives with unfavourable soil conditions) a greater part of the sales receipts (and sometimes all

profit) derives from it. These complementary activities do stabilize employment of the members, yet first of all they are sources of additional income and profit. The Hungarian economic policy supports them because they contribute to better supply, and mitigate the government burdens involved by financial support to farms with poor results. The more flexible industrial activity of the non-industrial organizations helps the "state-owned" industry, complements it, rarely competes – except for manpower. The agricultural establishments can frequently offer more flexible working conditions and greater income and this is a source of recurring tensions.

It is a further characteristic feature of the network of Hungarian industrial establishments that – as also shown by the data quoted – only a fraction of the establishments is also an independent enterprise. In the *state-owned* industry we find a relatively high concentration of labour by international comparison. Merely 25 percent of workers work in establishments with a staff less than 300 (see *Table 2*). But from this we cannot conclude on a similar high concentration of production. Compared with more advanced countries, namely, it has to be taken into account that the Hungarian firms frequently employ a staff 2 or 3 times higher for the same output than is the case in the West. A comparison performed with data corrected for this fact³ does not show at all that the ratio of "large establishments" would be high. As a further correction it ought to be considered that the Hungarian establishments themselves perform such complementary activities which are usually done by and bought from specialized independent organizations in other countries. Thus, regarding the scale of output, the quantity of the products released, and, particularly, the quantities released from individual products, the size of *production lots*, – several establishments employing many thousand people do not attain the so-called minimum efficient establishment size which is the lower limit of competitive production.

To 2500 non-industrial organizations there belong almost 15000 – mostly small – industrial establishments carrying on industrial activity. With 21 percent of all industrial establishments of the whole socialist sector, the state-owned industrial firms employ not quite 75 percent of the total staff engaged in industrial activity.

If we consider not only the so-called state industry, but the whole of industrial activities, the majority of industrial establishments employ less than 300 people. These employ almost one third of all people engaged in industrial activity. Considering that their productivity attains on average – in the best case – about half of the standards of similarly staffed establishments in developed countries, the majority of the Hungarian establishments may be classified rather as small than medium-sized ones. The Hungarian relations are thus characterized by the fact that small and medium-sized establishments do exist, but their majority is not independent, their technological equipment is poor and their possibilities for growth and development are strongly limited. And these industrial establishments do not wish to separate, they would rather remain under the umbrella of a larger organization.

The structure of the state-owned industry is characterized by high *enterprise*

³Román, Z.: Industrial organization in Hungary. *Economic Planning and Management*. Papers of the Fourth Hungarian-Indian Round Table of Economists. Budapest, 12-15. October 1981. New Delhi.

Distribution of employment by size categories of industrial establishments and enterprises in the socialist (state-owned and cooperative) industry, 1983, percent

Size category (number of workers)	Distribution of the employment of industrial			
	establishments		enterprises	
	State-owned	Cooperative	State-owned	Cooperative
	industry			
–50	4.0	26.9	0.1	0.1
51–100	4.4	21.9	0.1	2.7
101–300	16.5	39.8	1.8	41.0
301–500	13.2	6.9	3.7	25.7
501–1000	24.4	4.5	13.7	20.6
1001–2000	20.5	–	22.3	8.7
2001–5000			32.1	1.2
5001–10000	17.0		13.2	–
10001–			13.0	
Total	100.0	100.0	100.0	100.0

concentration: the 4579 industrial establishments are managed by 715 enterprises. We only have 1975 data about the number of establishments belonging to enterprises, but the situation has not changed much since then. About three fourths of the 715 enterprises manage several establishments, only one fourth of them is an independent firm with a single establishment (see Table 3). The industrial cooperatives are also characterized by having several establishments.

This form of management became general already after the nationalizations of the late forties and gained further momentum with a wave of centralization in the first half of the sixties. In 1960 there still were 1338 state-owned industrial enterprises, in 1965 only 840. In several branches of industry (first of all in the building materials and the food processing industries) all earlier independent firms were merged into a single large company. Later this seemed to be in contradiction to the principles of the reform of economic control and management – first of all from the viewpoint of market competition – but many experts challenge the expediency of this decision also independently of the reform. As against the guidelines of the reform, enterprise centralization continued till 1980, when the number of firms fell to 700, and the process was stopped by the government. (Almost one third of the enterprises were managed by trusts, thus the number of truly independent economic units was even lower.) After the reform, centralization was partly motivated by the endeavour of some large firms to solve their cooperation problems by amalgamating their suppliers. In other cases the control agencies sought this way of solution because of profitability problems or other enterprise troubles, and also favoured these steps because it seemed a simpler task to control a smaller number of enterprises.

Table 3

**Distribution of state-owned industrial enterprises by the number of establishments,
1975, percent**

Branch	Enterprises with						Total
	1	2	3-5	6-10	11-20	21-	
	establishments employing 20 or more people						
Mining	33	7	27	30	10	3	100
Electric energy	33	24	19	19	5	—	100
Metallurgy	66	19	—	11	4	—	100
Engineering	13	14	41	25	4	3	100
Building materials ind.	6	12	23	27	23	9	100
Chemical industry	24	20	37	13	6	—	100
Heavy industry	20	15	33	33	7	3	100
Wood, paper and printing industries	33	27	28	7	4	1	100
Textile industry	15	19	32	24	10	—	100
Light industry	22	22	34	15	6	1	100
Other industries	43	18	21	16	2	—	100
Food processing ind.	21	11	30	23	14	1	100
Total state-owned industry	22	16	32	20	8	2	100

In comparison to the other centrally planned economies the enterprise concentration of the Hungarian industry is not particularly strong – looking at it either from the viewpoint of employment size categories or any other indicators – (lagging though behind Czechoslovakia and Romania), but extremely strong in comparison to the market economies. As could be seen, this derives not so much from the size of establishments as from the overwhelming weight of multi-plant enterprises. Of course, a large company has many advantages as regards concentration of resources, economies of scale and access to markets, yet their ratio is *too* high in Hungary.

The presently prevailing concept in Hungary is that large enterprises are necessary in certain areas and branches (we may add that by international standards they are not really large firms), but the enterprise structure is on the whole too centralized. Also there is consensus in that such organizational re-arrangement would be desirable which relies on natural processes, market effects, on growth or disintegration depending on performance. That is, an inefficiently operating large company would sooner or later disintegrate into its components or certain units would separate from it. At the same time smaller firms would grow if they proved successful and would have the opportunity to acquire units of other enterprises and thus attain a larger size.

This however — in addition to the fact that we have not yet succeeded in devising its mechanism — would remedy the present extreme situation only very slowly. It seems, therefore, unavoidable to break up enterprises through central decisions. This has been proceeding since 1980 at a slow pace and has brought some (relatively few) results. Several trusts have been liquidated and some units have been separated from certain large companies, a few large enterprises have been completely broken up into factories, but no substantial changes have taken place as yet.

Recent Steps Taken to Improve Organizational Patterns

The further improvements of industrial organization strives to adjust them to the envisaged development of economic control and management, above all to the intention to increase enterprise autonomy and the role of the market.

In 1984 an important decision was taken in order to increase enterprise autonomy: in the state-owned industry new forms of enterprise management have to be introduced till the end of 1986. With a relatively few, but large firms — in which about 30 per cent of the staff employed in the state-owned industry are working — the presently prevailing system of ministerial control will be maintained. In a greater part of enterprises, affecting an even greater proportion of the workforce, the formal dependence of the enterprises on the ministry will cease: management will be exercised by an enterprise council. Its members will partly be elected by the workers, and partly appointed by the manager. The manager will be elected by this council, for a definite term. Several details of this form are still being worked out, and will perhaps be modified, too. (Thus, e.g., in the course of preparation there were many advocates of the version — I too, consider it to be better — that there should also be such members of the council who are not enterprise employees, thus strengthening external control and advice.) In smaller enterprises the manager will be elected not by the enterprise council, but directly by the assembly of employees which also decides in questions of major importance. In both new forms of enterprise management the employees themselves will exercise the role of the owner, but it is to be feared that, as against the long-term interest in return of capital, they will put the short-term interests of employees to the fore. The practical experiences with the introduction of the new forms ought to be followed up and analysed in this respect too.

The legal rules have essentially increased the role of the bodies representing various interests — first of all of the Trade Unions and the Hungarian Chamber of Commerce — and further steps may be expected in this direction. Work is in process aiming at the new regulation of the institutional system of the control agencies. This ramifying subsystem is characterized by the fact that supervisory, branch, functional, territorial as well as government and party control assert themselves side by side. The scope of authority is not always unambiguously delimited and in practice some institutions frequently reinterpret or transgress the framework set down in legislation. It causes serious concern to restrict the role of informal groups based on interests of branches, areas etc.

Another important fundamental goal of transforming the industrial organization

is to leave larger room to market effects in stimulating performance and in regulation. We are, of course, aware that a larger number of producers – and such distribution of their market shares that none of them should dominate the market – are *necessary but insufficient conditions* of market competition. Endeavours are under way to bring about and consolidate all the other conditions:

- autonomy of enterprises and their interest in increasing profit;
- free movement of prices according to the market relations;
- a total capacity of producers present on the market (and of potential ones) that exceeds the demand (also reckoning with imports);
- access to or entry into the market without barriers; and
- clear rules of competition, valid for everyone; the securing of their observance and fair competition.

Unfortunately, these conditions are present today but in a restricted sense, first of all because of the precarious equilibrium position of the economy. Interference with the life of enterprises occurs more frequently than would be desirable, prices are controlled and checked centrally in a wide domain, and imports are often restricted in the interest of improving external equilibrium. Important steps were taken for lifting the administrative barriers to entry into market; a new law has been passed (Act IV. 1984) to secure fair competition and the new forms of enterprise management are expected to help in consolidating enterprise autonomy.

In the manufacturing industry we examined in 637 groups of products, representing 75 percent of total output, how many independent economic units participate in the production of the individual product groups.⁴ There is a single producer – thus one in monopoly position – in 21 percent of the product groups examined, and 20 percent are turned out by 2 or 3 producers. But 61 percent of the product groups are released by more than 3.47 percent by more than 6 and 27 percent by more than 15 independent units. But the investigation also showed that in a greater part of cases one or a few producers *dominate the market* (see *Table 4*). Out of the 637 product groups examined more than two thirds of the output are released by the largest producer in 323 cases, and by the three largest ones in 508 cases. It is typical that otherwise a relatively small part of production is distributed among a large number of producers. Presumably, market competition would not be strengthened even if more producers entered into the market, but if "small producers" significantly increased their output with greater specialization, initiated competition in respect of quality and price, and thus would also prompt their "big" competitors to better performance.

As regards the organizational conditions of competition, alleviation of the exaggerated centralization is continuing, a part of large multi-plant firms in being broken up. Several legal measures have been initiated to stimulate the foundation of small firms and other ventures, affiliates and joint enterprises, including the stimulation of private (small-scale) industry and other undertaking. Yet, in order to develop small and medium firms, to help the smaller establishments in becoming independent,

⁴For details see: Román, Z.: *The Conditions of Market Competition in the Hungarian Industry. Acta Oeconomica*, Vol. 34, Nos 1–2 (1985) and also the paper of E. Bagó in this volume.

**Distribution of the product groups examined by share in total output
of the three largest producer economic units**

Groups of industrial branches	The share of the three largest producers in total output				Total	Number of product groups observed
	-50.0	50.1-	66.7-	90.1-		
	percent					
Metallurgy, building materials industry	7.9	3.9	11.0	77.2	100.0	127
Engineering	6.5	7.7	26.8	59.0	100.0	246
Chemical industry	2.0	3.0	12.0	83.0	100.0	100
Furniture, paper and printing industries	19.4	19.4	22.2	39.0	100.0	36
Textile and clothing industry	22.4	22.4	14.9	40.3	100.0	67
Food processing industry	31.2	18.0	13.1	37.7	100.0	61
Total	10.8	9.4	18.6	61.2	100.0	637

and the creation of new units, also one or several central *state institutions* with appropriate financial funds ought to be established. Without them a substantial increase in the role of small and medium enterprises cannot be expected. Nor has it been worked out as yet how a successful small venture may grow into a large enterprise. For the reverse case, i.e. for the rehabilitation or liquidation of enterprises, the legislation is under preparation. After some preliminary steps, already taken, work is going on to promote the flow of capital between enterprises, to work out the concept of a capital market, operating under socialist conditions. Research into the organizational conditions of strengthening the links between research, production and marketing also continues.

Some questions of the industrial organization are also treated in several other papers of this volume. In the following I will mention an experiment which has also aroused great international interest, but which is difficult to evaluate by those who are not familiar with the rules and conditions of the management of the Hungarian enterprise. I think of the workteams, the intrapreneurial groups of enterprises.

*Intrapreneurial Groups*⁵

In establishing the form of intrapreneurial groups (IG) the original starting point was that in the agriculture it had been a great success to provide an opportunity for household-plot and complementary economic activity beside common farming (1.5 million

⁵Z., Román: Productivity, Entrepreneurship and Intrapreneurship in the Hungarian Economy. *Europe Productivity Ideas*, Jan. 1984.

small plots contribute one third of the total agricultural output); now, a similar possibility ought to be provided also for those working in the industry. Their additional performance and entrepreneurial spirit would not only earn higher income, but also help the economy by improving supply, making up for shortages, perhaps expanding exports and substituting for imports. After an initial hesitation, the number of intrapreneurial groups started to grow rapidly. In the industry, in 8532 units about 5 percent of all employees participated in them on May 31st, 1984 the total force of such teams being 13572, and earned 40-50 percent additional income with an average additional labour input of about 20 percent. But the dispersion within these averages is very high.

In one third of industrial enterprises there is no IG at all, in another third there are only a few, while elsewhere the participation reaches even 20-25 percent of the total employment. There are large differences also in labour time input and incomes. As against the original idea, according to our surveys they are mostly not internal ventures, but fall roughly into two large types. One of them is where workers continue the same activity after the legal worktime but not against overtime payment – they receive an "entrepreneurial fee" for the work done. This is not charged against the wage fund of the enterprise, but can be accounted as general (overhead) cost; the enterprises do not run thus against wage constraints and save the high progressive taxes on wages. (If a different regulation prevailed and enterprises had to cover the remunerations from the wage fund with the usual constraints and burdens, it is likely that much fewer of them would be operating. This feature bears some resemblance to the shadow economy.)

Another form is when the workers of the enterprise themselves perform – similarly after legal worktime – those maintenance, repair and other services which were earlier done by external firms. This is usually much cheaper for the enterprise than to pay the external firms which calculate their prices with a high overhead; while the members of the team can often keep 70-80 percent of the total fee charged to the firm. (In principle it is obligatory to reckon with overhead costs and charge them to the team, but an exact accounting rarely takes place.)

The members of the team are mostly the more diligent and most able workers, who much depend on additional income and thus also exhibit higher performance. This is also one of the reasons why productivity is on average 50 percent higher in the team than during the normal worktime. It probably has a positive impact, too, that they elect their leader themselves and work more flexibly and with better organization. (In some cases it may contribute to the higher productivity that they prepare their work already during the regular hours of work.)

In the summer of 1984 we surveyed the activity of 2000 Intrapreneurial Groups.⁶ We inquired also into the problem of the about 50 percent higher productivity. Relying on experience with preliminary investigations, we specified 8 explanatory factors. The opinions we got from enterprises (of which even several ones could be identified by those questioned) are summarized in the following table:

⁶See Z. Román: Productivity, Entrepreneurship and Intrapreneurship in the Hungarian Economy. *Europe Productivity Ideas*, January 1984.

**Estimation of the factors explaining the higher productivity
of Intrapreneurial Groups**

Explanatory factors	Number of		Estimated contribution of the factor	The margin of the factors' estimated contribution*
	enterprises	estimations		
	indicating a role of the factor		percent	
1. Higher labour intensity	41	74	34	10-80
2. Better selection of workers	40	72	30	10-60
3. Better work organization	37	69	25	10-50
4. Better selection of team leaders	15	24	5	5-20
5. Selection of "more productive" work	15	21	3	5-30
6. Use of the legal worktime for the team's activity	13	22	2	3-30
7. Use of more productive machinery	6	8	1	10-20
8. Other	2	2	—	45-60

*Eliminating the two lowest and highest values.

Intrapreneurial Groups have been subject to much discussion in Hungary from the outset. (This is also reflected by the fact that in a considerable part of the firms there are no such units, even to this day.) In enterprises where this form is actually present they help in increasing production in the case of such bottleneck where surplus performance cannot be achieved either because of constraints on overtime or wages, or because workers do not undertake additional effort for the usual remuneration. Frequently, not insignificant saving is achieved by their undertaking the work in question for lower payment than what ought to be paid for external services. Also, they reduce labour migration with which many industrial firms are struggling because of the attraction of better paying workplaces. Thus, many positive impacts of the Intrapreneurial Groups can be listed.

At the same time, it causes problems that, as against the household-plots and auxiliary farming, membership in the group cannot be secured for every worker of an enterprise, but only for a small part of them. This may produce tensions within the firm. With the system the worktime — the legal reduction of which was hailed as a great achievement — is prolonged; though it is true that industrial workers have spent a no small part of their leisure time with (other kinds of) surplus work even up to now. At times even extremely large incomes may come about in these organizations, but they can be contained between limits with proper control. The main task is to transfer the positive experience with these workteams to the main job, to the work

done during regular hours of work. Workers are also during regular hours willing to offer the same higher performance that came to the surface in this form, if the work is adequately prepared and remunerated. Besides, based on these experiences it is worth while considering the creation of *true* intrapreneurial forms, groups, units – mainly in the framework of activities performed during legal worktime.

Concluding Remarks

The rate of post-war economic growth was high in Hungary even by international standards. Between 1950–1962 and 1982–1984 national income increased on average by 5.0 percent p.a., labour productivity by 5.5, total factor productivity by 2.9. This might be attributed first of all to the annual 7 percent increase of industrial output and to the annual 4-5 percent increase of industrial labour productivity. The 1968 economic reform gave a new impetus to growth but because of changes in world economy, a belated adjustment to them and the slowing down of the reform process it spent its force from the mid-seventies.

Although the index numbers of economic growth and productivity only show a break in the trends beginning with 1979, the indexes corrected for the terms-of-trade-losses already show it beginning with 1974. According to the data of *Table 6*, after 1976/1978 the number of active earners in the sphere of material production fell by 1.4 percentage points and in the course of the intended and then necessary deceleration, resp. slowdown of growth, the growth rate of labour productivity diminished by 2.7 percentage points. The output/capital ratio fell by annually 3.2 percent and total factor productivity hardly increased. Although the new orientation of economic policy after 1978 is characterized by an approach better counting with realities and a resolute continuation of the reform of economic control and management, an essential slowdown of the growth of the economy, industrial output and productivity was unavoidable.

The slowdown of productivity growth is a combined result of a great many factors – frequently with a certain time lag. In an open market economy poorer technological standards and unsatisfactory quality of products put a brake on growth in a relatively short time. In a centrally planned economy, however, the assertion of this impact may be delayed – if not without consequences and depending on the state of openness of the economy. In the slowdown of the Hungarian economy and industry after 1978 also the problems and neglect of earlier years come to expression. Important roles are played, in addition, by the suppression of earlier positive impacts (as e.g. the shifts in employment between industry and agriculture), the unfavourable changes in world economy, the slower than expected development of CMEA-cooperation and – to a growing measure – by the necessary curbing of investments. But the most important cause is the poor world market competitiveness of the Hungarian economy, first of all of manufactures. The growth of productivity (and of output) has been and still is delimited in many fields directly by the import of raw materials and energy, but behind this we find indirectly the circumstance that the industry could not and cannot increase its exports saleable for convertible currency to the needed extent. This

Table 6

Growth of the Hungarian economy and its sources

	Annual growth rate, percent					Difference, in percentage points between the		
	1950/52– 1957/59	1957/69– 1966/68	1966/68– 1976/78	1976/78– 1982/84	1950/52 1982/84	2nd and 1st	3rd and 2nd	4th and 3rd
	subperiods							
National income	5.4	5.6	6.1	2.0	5.0	+ 0.2	+ 0.5	–4.1
Population	0.6	0.3	0.4	0.2	0.4	–0.3	+ 0.1	–0.2
Per capita national income	4.8	5.3	5.7	1.8	4.6	+ 0.5	+ 0.4	–3.9
Employment	0.5	0.5	0.6	–0.4	0.35	0	+ 0.1	–1.0
Ratio of active earners in the sphere of material production	0.3	–0.1	–0.3	–0.5	–0.15	–0.4	–0.2	–0.2
Number of active earners in the sphere of material production	1.4	0.7	0.7	–0.7	0.6	–0.7	0	–1.4
Labour productivity	4.0	4.9	5.4	2.7	4.4	+ 0.9	+ 0.5	–2.7
Output/capital ratio	0.1	0.7	–0.4	–3.6	–0.6	+ 0.6	–1.1	–3.2
Substitution of labour by capital	0.8	1.3	2.0	1.9	1.5	+ 0.5	+ 0.7	–0.1
Total factor productivity	3.2	3.6	3.4	0.8	2.9	+ 0.4	–0.2	–3.2

weakness of world market competitiveness is caused by the unsatisfactory quality of products, their failing up-to-dateness (technical standards), the slow structural adjustment to demand and (partially for external reasons) by the access to the western markets.

According to several indications to this are added the weaker motivation of enterprises, the enterprise behaviour which cannot be effectively prompted to greater entrepreneurship and higher performance either by the incentives or by the stricter economic environment. For a better *performance* a different *behaviour* and a *structure* provoking it are needed. The steps taken in order to improve the system of economic control and management, its organizational and institutional framework, as outlined above, are aimed at bringing about such changes in the industrial organization.

GROWTH AND PRODUCTIVITY IN THE HUNGARIAN ECONOMY AND INDUSTRY, 1968–1982

LÁSZLÓ CHERNENSZKY–KATALIN DEMETER

One of the most conspicuous phenomena of world economy in the seventies was the changing rate of economic growth. The slowdown of growth following the oil price explosion of 1973 affected all the most advanced capitalist countries and – with a delay of a few years – the socialist countries, too. The signs of slowdown in the early 1970's also appeared in Hungary but a dramatic change came to pass only after 1978.

Holding back growth, restricting internal consumption, employing the tools of import limitation and export stimulation were all aimed at improving the balance of foreign trade. The above mentioned task, however, can only be achieved by strengthening the *competitiveness* of the Hungarian economy. An important factor of competitiveness is productivity, consequently, analysing it enables us to make an international comparison regarding the productive capacities and the efficiency of inputs in the Hungarian economy.

In our study we are going to analyse the development and productivity of the Hungarian economy¹ and within it that of the industry from 1968 to 1982. In order to identify more clearly the characteristics of the analysed period we will review longer periods, too, in certain cases in the course of analysing the factors influencing economic growth and the development of productivity. Economic growth will be surveyed by using the traditional means of statistical analysis.

The method applied in this paper *reduces growth essentially to two components*: one of them is the changing quantity of inputs (labour and fixed assets), the other one is the changing efficiency of the inputs (i.e., labour productivity, the efficiency of fixed assets, and total factor productivity).² Thus, we tried first of all to detect the

¹We have limited our analysis to the so-called "material" sectors, since Hungarian statistical accounting considers only these (industry, construction, agriculture, transport and communication, trade and water economy) as producers of national income.

²Total factor productivity stands for the comparison of output with the total inputs of labour and fixed assets. In our computations we determined the pace of changing labour and fixed asset inputs as the weighted average of the two factors' indices in volume. The changes in labour input were weighted by the amounts of wages + taxes on wages and the dynamics of the fixed assets by the total sum of depreciation allowance plus the charges on assets. The changing rate of output was compared to the change of the so-called total inputs determined in the above mentioned way.

This type of numerical survey of the sources of economic growth was first applied in Hungarian economic literature by Zoltán Román (Román, Z.: *Productivity and Economic Growth*. Akadémiai Kiadó, Budapest 1982).

trends of quantity and sectoral structure of the output and, respectively, of the two major factors of production and of the efficiency of the two resources. (The changes which occurred in the conditions of growth can be described adequately by taking into account even wider interdependencies. A significant part of the relevant factors and their effects, however, cannot or can only very hardly be quantified, therefore had to be approached by the traditional means of statistics applying much more assumptions than usual. Some of these factors will be referred to later on in the course of our analysis, or in the concluding remarks of the study.)

Output was expressed in the computations in the case of material sectors by national income created, in the more detailed analysis of the industrial (sub) branches by gross value of production. Capital input was measured by the gross value of the fixed assets while labour input in the material sectors by the number of active earners, in the case of industry by hours worked. The indices of output and fixed assets we applied were based on the data at constant prices so that they did not indicate the effects of relative price changes which took place during the analysed period (the rise in the prices of material and energy, the deterioration in the terms of foreign trade).

1. *Growth and Productivity in the Material Branches*

Between 1968 and 1982 the Hungarian economy reached a relatively high dynamism of development which relied on the similarly high growth rate of productivity (*Table I*). 45 percent of labour productivity originated in substituting capital for labour and 55 percent from increased total factor productivity, i.e., from increasing efficiency. Low dynamism of the efficiency indices can be traced back partly to the high pace of increase in the stock of fixed assets and partly to the declined efficiency of utilizing the assets (i.e. low capital productivity) which characterized the whole period.

By separating the period between 1979 and 1982 from the whole it can be seen that not only the general characteristics of growth but the indices of efficiency also developed unfavourably. The increase of labour productivity as a whole was provided by capital substituted for labour since total factor productivity decreased both in absolute and relative terms. The growth rate of the fixed assets diminished only by 0.5 percentage points which means that the degree of deterioration in capital productivity almost trebled.

The survey of the indices characterizing the growth of material sectors (*Table I; Fig. 1*) allows for some statements of more general nature. The years 1973–1974 may be considered a turning point in view of economic growth and development of productivity – even apart from the changes in world economy. Since 1973 the number of people employed in the material sectors has been decreasing and since this year the growth rate of labour productivity has exceeded that of the national income. The dynamism of producing national income slowed down from 1974 and, parallel to this, – since the extension of the fixed assets did not change – capital productivity declined increasingly.

Substantial changes in the measure of growth came to pass in 1976 and later on in 1979 as the result of economic political interventions. However, the statistical data

**Annual average changes of production and of factors of production in the sectors of material production
of the national economy, 1960–1982**

Time period	National income	Labour input (number of employees)	Fixed assets	Labour productivity	Fixed asset efficiency	Labour and fixed asset input	Total factor productivity	Substitution
	a)		a)	b)	c)	d)	e)	f)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1961–1968	5.2	−0.1	5.0	5.3	0.2	1.8	3.3	2.0
1969–1973	6.3	1.1	6.5	5.2	−0.1	2.8	3.5	1.7
1974–1978	5.4	−0.5	6.5	6.0	−1.0	1.8	3.7	2.3
1979–1982	1.5	−0.8	5.9	2.3	−4.2	1.7	−0.3	2.6
1969–1979	5.9	0.3	6.5	5.6	−0.6	2.3	3.6	2.0
1969–1982	4.6	0.0	6.4	4.6	−1.7	2.1	2.5	2.1

Source: Author's own computations based on Statistical Yearbook 1982 (Statiztikai Évkönyv, 1982. Statisztikai Kiadó Vállalat, Budapest.) (pp. 2–4)

Methodological and conceptual remarks:

a) from volume indices of national income and fixed assets data at constant prices

b) labour productivity = national income per employee (4) = (1) – (2)

c) fixed asset efficiency = the change of national income per unit of fixed assets (5) = (1) – (3)

d) Inputs of labour and fixed assets, together = calculated from the weighted indices of active earners and fixed asset stocks (6) = a · (2) + (1–a) · (3)

The weights are: labour inputs = wages + wage tax

fixed asset inputs = depreciation + charges on assets

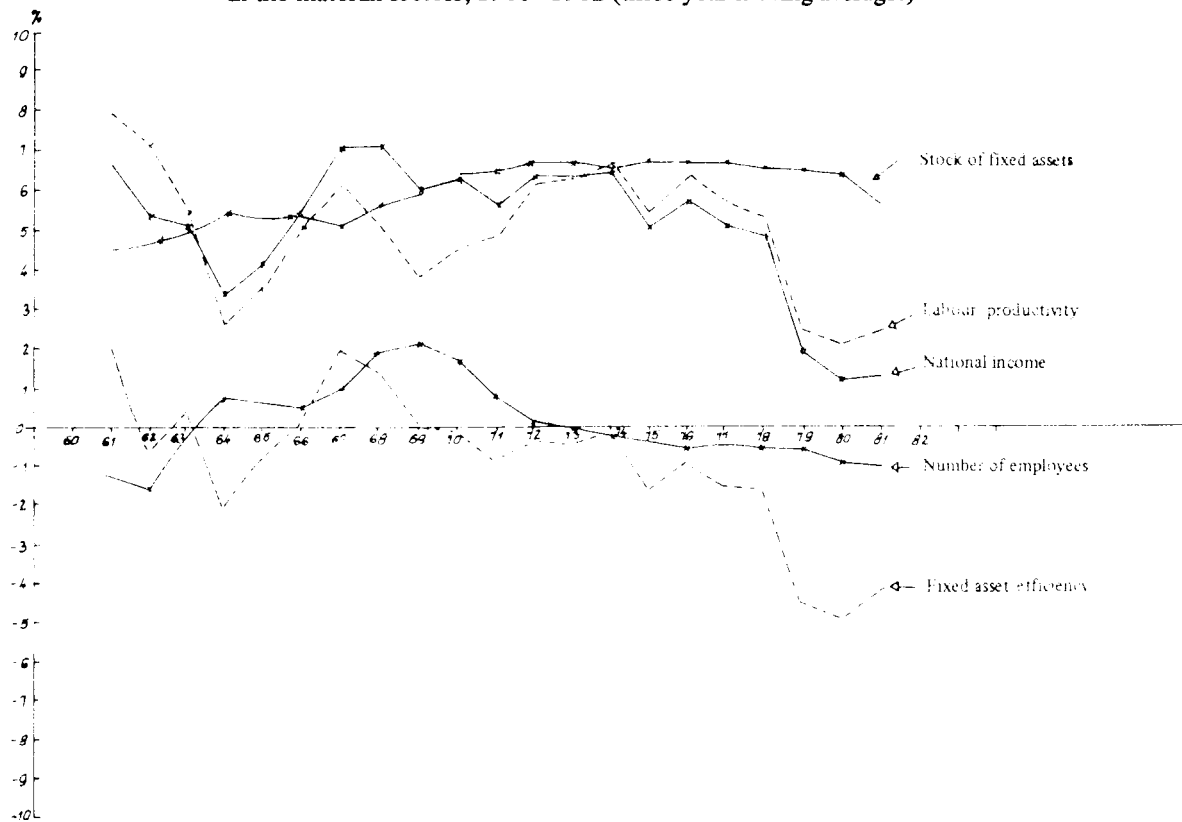
for the years 1960–1970 weights of 1961

for the years 1970–1982 weights of 1971.

e) total factor productivity = national income (labour and fixed asset inputs (7) = (1) – (6)

f) substitution = the effect of replacing labour with fixed assets (8) = (6) – (2) = (4) – (7).

Dynamics of growth, changes of labour force, fixed assets stock, productivity and fixed asset efficiency in the material sectors, 1960–1982 (three-year moving averages)



series surveyed from 1969 on call attention to the fact that *internal economic automatism*s caused the slowdown of growth earlier because the shortage in the quantity of resources was not counterbalanced by increasing efficiency.

1.1 *The Stock and Efficiency of the Fixed Assets*

The least fluctuation was shown in the pace of the increasing stock of fixed assets in the sixties and the seventies. The dynamism of the fixed assets accelerated evenly in the sixties and became steady in the seventies. The basis for the high growth rate in the fixed assets was partly the outstanding ratio of accumulation, high even in international comparison, and partly the very slow pace in scrapping and replacement. From the early seventies on, the dynamism of fixed assets exceeded the growth rate of national income permanently and in an ever increasing measure. As a result, fixed asset efficiency, i.e., the output/fixed asset ratio deteriorated ever more in the material branches of the national economy. Between 1969 and 1973 the average decline was only one-tenth of a percent per annum, while between 1974 and 1978 it reached a yearly one percent – as a result of the retardation in the growth of national income. From 1979 it increased to 4.2 percent per annum. Basically the following factors contributed to the worsening of the fixed asset efficiency:

(1) The decrease of those employed in the material branches became permanent after 1973. For this reason an ever higher ratio of the increase in fixed assets was serving for the substitution of labour.

(2) According to our analysis, the reserves of growth deriving from the modified distribution of fixed assets among the particular branches decreased. In the fifties and sixties forced development of the direct producing sectors (industry, construction and agriculture) and a certain negligence of the infrastructural branches³ triggered the high growth rate of the economy.

By the early 1970s, however, the relative backwardness of the infrastructural branches caused tensions (through the modification of the proportions in investments and the bottlenecks following) which increasingly restricted economic growth and contributed to the worsening efficiency of the fixed assets.

(3) Fixed asset efficiency also deteriorated within the particular material sectors, because

- in certain branches some areas were more capital-intensive, came temporarily to the foreground (for instance within industry the ratio of the investments into power generation, requiring large quantities of equipment with low rate of return, grew at the expense of the manufacturing industry),
- owing to marketing problems, utilization of the capacities decreased to a great extent.

³ According to the Hungarian terminology productive infrastructure includes transport and communication, trade and water management, and non-productive infrastructure contains education, health services, administration and so on.

**The components of changes in the fixed asset efficiency
in the material sectors of the national economy⁴
(1968–1982)**

percent

Period	Average annual change of fixed asset efficiency a)	of which		
		change within the sector b)	effect of structural changes	common effect
1968–1973	–0.15	–1.67	1.61	–0.09
1973–1978	–1.08	–2.30	1.49	–0.27
1978–1982	–4.26	–5.14	0.96	–0.08

a) fixed asset efficiency = national income/gross value of fixed assets

b) material sectors included are the following: industry, construction, agriculture, transport and communication, trade (water economy is not included)

Remark: Owing to roundings applied in the computation, the data of the first column differ somewhat (± 0.1 percent) from the corresponding data of *Table 1*.

As it can be seen from the data of *Table 2*, among the causes of deteriorating efficiency which have been examined, those within the branches can be considered as the primary ones.

1.2 Labour Input and Labour Productivity

In the Hungarian economy the number of the active earners continuously increased (both in the material and in the non-material sectors) from 1962 to 1976; at that time it reached the level of 5.093 thousand which can be considered a long time peak and by 1982 it fell back to 5.002 thousand. In these two decades the distribution of the inflowing labour by branches changed and so did the direction of the flows among the branches.

In the sixties 55–60 percent of the manpower released lately from agriculture entered industry, between 1968 and 1973 30 percent of it did so. As a result of this the structure of employment showed the picture of "over-industrialization" to a

⁴The formula of breaking down the change of efficiency to its factors can be found in the *Appendix*.

certain degree. Outflow of the labour force from industry became stronger after 1973.⁵

Gaining ground by the infrastructural branches accelerated essentially after 1968: in 1960–1968 31 percent of the manpower increase outside of agriculture took place in the infrastructural branches, in 1968–1975 this proportion was 53 and in 1973–82 it became more than 100 percent. (The number of people leaving industry exceeded the decrease of manpower in agriculture and at the same time the number of active earners also declined significantly.)

According to our survey, though the changing number of manpower diminished the labour input in the material branches, this was almost entirely *compensated* by the rising standards of education and professional training. The changes appearing in the quality of labour, as a whole, influenced the conditions of growth favourably.

Between 1969–1982 *labour productivity* increased on the average by 4.6 percent annually in conformity with the increase of national income. By the mid-seventies, however, in the development of the two indicators as compared to one another a change came about. While in the first part of the decade, national income grew at a higher rate than labour productivity, in the second part – due to the decrease in the number employed – the dynamics of national income lagged behind the growth of labour productivity.

The dynamism of productivity in the period of 1969–1978 exceeded that of the preceding decades. (Between 1951–1960 the annual average growth was 4.1 percent, in 1961–1968 5.3 and in 1969–1978 5.6 percent.) Applying a different periodization from that in *Table 1* it can also be found that between 1971–1975 the annual average growth rate of labour productivity was 6.2 percent and in 1976–1978 "only" 5.7 percent. The slowdown in the dynamism of labour productivity that appeared in the late 1970s – owing to the declining number of people employed – was not as marked as the retardation of economic growth. In 1979–1982 when the growth rate of the national income dropped to one-third of the average in the analysed period the dynamism of labour productivity decreased to its half.

The positive effect on the increasing productivity of the analysed period exercised by structural changes definitely declined, both absolutely and relatively. (See *Table 3*.) Hence, the part of productivity growth ascribed to the fact that labour was flowing from the less efficient branches of national economy towards the more productive ones, decreased. Towards the end of the analysed period the dynamism of productivity was increasingly determined by the changes of productivity *within* the branches. (Between 1968 and 1982 the productivity of industry grew 2.2 times, that of construction 1.7, of agriculture 1.7 and that of transport and communication as well as of trade 1.5 times.)

⁵The decrease of manpower in the organizations treated as industry by statistics does not necessarily mean the decrease of the number of those pursuing industrial activities. Namely, a part of those who leave industry continue to perform industrial jobs in a non-industrial organization (in agriculture, trade, or construction). According to various estimates, the number of people engaged in industry began to decrease from the early eighties.

**The components of changing labour productivity in the material sectors
of the national economy (1968–1982)**

(percent)

Period	Average annual change of labour productivity a)	of which		
		change within sectors b)	effect of structural changes	common effect
1968–1973	5.0	3.5	1.40	0.13
1973–1978	5.9	5.4	0.35	0.08
1978–1982	2.4	2.7	-0.18	-0.10

a) national income/number of persons employed

b) industry, construction, agriculture, transport and communication, trade

1.3 *The Factors of Demand*

The growth rate of the national economy is determined naturally not only by the quantity and sectoral proportions of the factors of production. Out of the numerous other factors (such as demand, changes in technology, organization, utilization of capacities, etc.) we wish to deal only with the development of external and internal demand – i.e., with consumption. In our analysis we are going to differentiate the inputs in other production processes, public and private consumption, investment, accumulation of stocks and exports.

The part of the production used as inputs to other productive processes appears in statistics as "current consumption of materials and intermediate products". Up to the mid-seventies, the costs of the current material and semi-finished product consumption accounted for a relatively uniform share in the production value of the material branches (54–56 percent). Later on two jumps can be observed in the data given at current prices: the first one in 1975 and the second in 1980, the result of which was that by the early eighties the above mentioned ratio increased to 61 percent. In the rising material ratio the deteriorating terms of trade played a significant part, i.e. it was due to the fact that parallel to the price explosion of raw materials, the exports which constituted a major part of the output, became depreciated to a great extent.⁶

⁶It is worth mentioning that the deterioration of the terms of trade is not at all a novel trend in the Hungarian economy. Already in the period 1949–1970 a decline of the export product prices could be observed while the price level of imports remained unchanged. The change came forth to the measure of deterioration of the terms of trade. It must be mentioned here that taking into account the deterioration of about 25 percent after 1973, the slowdown in the dynamism of the national income in the mid-seventies was even more definite.

The increasing material consumption affected the conditions of economic growth unfavourably for it reduced the part of production destined for the purposes of final use (consumption, investments, etc.). As one of the priorities in economic policy was to maintain the achieved standards of living, the attempt to restrict the share of public consumption also remained unsuccessful, economic management was forced to improve the equilibrium of demand and supply by strongly reducing the measure of accumulation. (Public and private consumption amounted to 75 percent of the national income in the years 1970 to 1978 but later on – as the result of slow economic growth and mainly of the restriction on investments – it reached 80 percent.) In the late seventies the limitations on domestic use affected in the first line the share and volume of investments.

Within final consumption – in the period reviewed – the greatest fluctuation was experienced in accumulation (investments and stocks) and simultaneously in the balance of exports and imports. The increasing share and volume of accumulation in the early seventies was motivated by a number of (earlier mentioned) circumstances. The most important of these was very likely the attempt to counterbalance the impeding effect of declining asset efficiency on economic growth. Thus, the powerful growth of the ratio of investments in the 1970s (see *Table 4*) fostered the dynamics of economic growth and also the prevention of a more significant setback. However, economic growth, sustained by rising investments, has led, more or less as a logical consequence, to a serious deficit in the balance of trade. The following played a role in it:

- the investments implemented involved considerable imports;
- import-intensity (the import/output ratio) of current production greatly increased prior to the restrictions;
- the terms of trade deteriorated;
- the growth of the export capacity of the economy was lagging behind its import requirements.

This system of interrelations was the reason why the passive balance of trade could only be reduced or eliminated by the restriction of growth; within this, firstly by limiting imports and by restricting accumulation.

In the second part of the period analysed external demand changed markedly. The slowdown in the growth of the capitalist world economy after 1973 and the following rapid process of transformation in its structure essentially influenced the changes of Hungarian economic growth from the aspect of demand. After 1973 the share of the Hungarian exports in the imports of the OECD countries decreased. A strong over-supply, the depreciated Hungarian commodity structure and protectionism of the capitalist countries all played their part. Starting with the late seventies the opportunities to extend selling on the socialist market also narrowed. Further extension at customary pace of the demand of the CMEA partners was limited primarily by their own problems of indebtedness and the backwardness of the cooperation mechanism in the CMEA.

The ratios of net accumulation and of the balance of trade compared to the national income and average growth rate of the national income, 1960–1982 (at current prices)

	percent			
	1960– 1969	1970– 1978	1978– 1982	1960– 1982
Net accumulation/national income	22.7	29.6	22.6	25.4
Balance of trade/national income	–0.9	–4.4	–1.8	–2.4
Annual average growth rate of national income	5.9	5.7	1.5	5.0

Sources: Balances of the national economy, 1960–1970. pp. 74–75.

Balances of the national economy, 1970–1977. p. 28.

Balances of the national economy, 1975–1982. p. 19.

In the second part of the period analysed external demand changed markedly. The slowdown in the growth of the capitalist world economy after 1973 and the following rapid process of transformation in its structure essentially influenced the changes of Hungarian economic growth from the aspect of demand. After 1973 the share of the Hungarian exports in the imports of the OECD countries decreased. A strong over-supply, the depreciated Hungarian commodity structure and protectionism of the capitalist countries all played their part. Starting with the late seventies the opportunities to extend selling on the socialist market also narrowed. Further extension at customary pace of the demand of the CMEA partners was limited primarily by their own problems of indebtedness and the backwardness of the cooperation mechanism in the CMEA.

2. Industrial Production and the Development of Productivity

The dynamism of industry in producing national income throughout the whole period analysed as well as in any subperiod of it exceeded the growth rate of the national economy. The rate of increasing labour productivity was also higher than in the total of the material sectors. In 1969–1982, 64 percent of labour productivity emerged from substituting fixed assets for labour and only 36 percent was due to the improvement of total factor productivity. Since manpower engaged in industry continuously declined from 1975, from that time on the growth of labour productivity exceeded the dynamics of national income produced by industry. The great extension of the fixed assets also accounts for the fact that the regression appearing in the growth of labour productivity remained relatively small. The price paid for this was, however, an increased worsening of the fixed assets' efficiency – especially in the last third of the period concerned. (See *Table 5*.)

Table 5

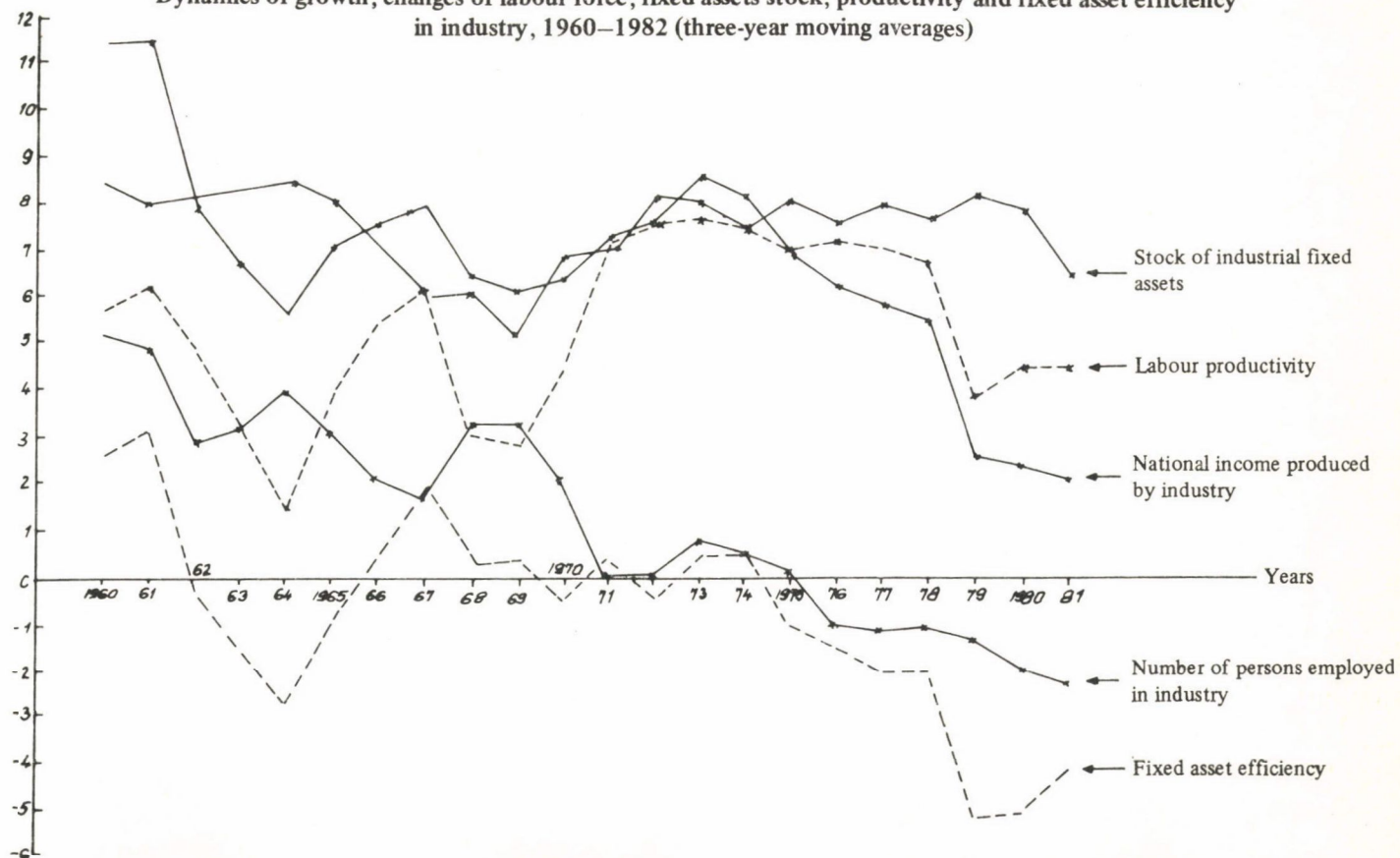
Average annual changes of production and factors of production in industry, 1960–1982
percent

Time period	National income	Labour input (employment)	Fixed assets	Labour productivity	Production (fixed assets)	Labour and fixed assets inputs	Total factor productivity	Substitution
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1961–1968	7.4	2.8	7.4	4.5	0.0	4.8	2.5	2.0
1969–1973	7.1	1.4	7.4	5.7	-0.2	3.9	3.2	2.5
1974–1978	6.5	-0.5	7.8	7.1	-1.2	3.3	3.2	3.9
1979–1982	2.7	-1.9	7.2	4.7	-4.5	3.1	-0.4	5.1
1969–1978	6.9	0.4	7.6	6.4	-0.7	3.6	3.2	3.2
1969–1982	5.6	-0.2	7.5	5.9	-1.7	3.5	2.1	3.8

Source: *Statisztikai Évkönyv 1982* (Statistical Yearbook 1982), Statisztikai Kiadó Vállalat, Budapest 1983. Author's own computations based on *Beruházási adattár 1950–1977* (Investment Data 1950–1977), Statisztikai Kiadó Vállalat, Budapest 1979. *Beruházási évkönyv 1982* (Yearbook of Investments 1982), Statisztikai Kiadó Vállalat, Budapest 1983.

Remarks: weights: labour inputs = wage + wage taxes
fixed asset inputs = depreciation allowance + charges on assets
for the years 1950–1970 the weights of 1961
for the years 1970–1982 the weights of 1971.

Dynamics of growth, changes of labour force, fixed assets stock, productivity and fixed asset efficiency in industry, 1960–1982 (three-year moving averages)



Apart from the average standard, the growth rate of industry also fluctuated considerably and frequently (see *Fig. 2*). Despite of these fluctuations it can be seen that from the mid-sixties up to 1973–1974 the production of the national income showed a basically accelerating trend while after this there was a monotonous decrease. Owing to the already described interventions and circumstances of economic policy, a new breaking point came about in 1978–1979.

2.1 Output

A more detailed analysis of industry revealed a surprising uniformity considering the tendencies in the development of the individual branches and those of the whole industry (these were partly mentioned before). The explanation is the great rigidity of sectoral structure.

For example regarding the dynamism in the output of the particular industrial branches the same breaking points can be observed as with the whole of industry (there are only two exceptions, mining, which was essentially stagnating and the building material industry which enjoyed the "suction" influence of the seventies' impetus in housing and other investment projects). The rank order in the growth of the most significant branches (mining, metallurgy, engineering industry, chemical and light industry and the food industry) was surprisingly constant — even in the years after 1978 when the dispersion of the growth rates grew less, and became half of that experienced for the preceding ten years. This means that it was a particularity of the structural transformation of the industry *that the fall of the growth rate affected all the branches*. Some actual but insignificant decrease of the production appeared only in two branches which were worldwide in a critical situation and in both only after 1978. Depreciation of the output of the economy made itself felt increasingly from the mid-seventies but it *did not bring about major rearrangements in the branch structure, changing the earlier trends*. (See *Table 6*.) An even more detailed analysis of industry (breaking it down to 59 sub-branches) also confirmed this finding. In the whole period between 1969–1982 actual decrease of the production came to pass only in three sub-branches (coal mining, the manufacture of bricks and tiles, and other woodworking industry). The decrease in two of them was less than 1 percent. From among the 56 sub-branches where production was growing, the average annual growth was more than 4 percent. *Even in the years 1979–1982 the dispersion of the sub-branches by the dynamism in their average yearly output did not grow*. Thus, the pace of the changing structural proportions has continued to be slow on the level of sub-branches and in this process the role of production narrowing was negligible.

2.2 Labour Input, Labour Productivity

The number of people employed by industry was still markedly increasing in the late sixties. In the first three years of the seventies this increase became moderate and after the peak reached in 1974 the labour forces began to decline, up to 1979 at a rate

**Average annual growth rate of production in the branches
of the socialist industry, 1969–1982 (percent)**

	1969– 1973	1974– 1978	1979– 1982	1969– 1982
Mining	2.4	2.6	–1.15	1.44
Electric power generation	8.14	7.87	2.47	6.39
Metallurgy ^a	5.35	3.82	–0.68	3.05
Engineering industry ^b	6.24	7.74	1.82	5.51
Building material industry	3.48	5.71	1.64	3.74
Chemical industry	10.56	9.35	2.18	7.68
Light industry	5.52	3.75	0.56	3.45
Other industry	12.25	7.0	1.93	7.35
Food industry	4.95	3.98	3.1	4.07
Socialist industry	6.0	5.85	1.5	4.64

^aMetallurgy: 1969–1974 = 6.0 1975–1978 = 2.55

^bEngineering industry: 1969–1974 = 7.2 1975–1978 = 6.73

of less than one percent per annum; from 1980 on the rate increased to 2 percent. In the period 1969–1982 the number of those employed in the socialist industry decreased on the average by 0.4 percent per annum. (There was a growth of 1.1 percent in the food industry, 0.6 in the chemical industry and in the engineering industry the number of employees remained essentially the same. The decline was most rapid in mining and the light industry –1.6 and –1.3 percent, respectively.)⁷ The decreasing dispersion of pace in the changing numbers of manpower can be observed well in the successive periods. In the course of increasing the changes in the distribution of numbers were more significant and the decreasing number of the employees was paralleled by a slowdown of structural modifications, too.

The number of hours worked in the whole of industry⁸ decreased between 1969 and 1982 annually by 1.4 percent on the average. During these fourteen years the worked hours per capita diminished by 13.3 percent.

The decreasing number of persons employed and hours worked was somewhat counterbalanced by the quality (education, training, schooling) of the workforce. We tried to quantify these effects (their size) on the basis of data available to us.⁹

⁷The most marked changes in the proportions of branch employment were: the share of the food industry grew from 11.1 percent to 13.2 and that of the light industry decreased from 24.0 to 21.6 percent.

⁸The per capita hours of all the employees were obtained by estimation: assuming that the total number of hours changed in the same proportion as that of the physical workers.

⁹It was an essential limitation in respect of labour that, owing to the lack of data we could only take into account the number of physical workers (whose ratio within the total decreased continually).

We determined the effect of the "quality" changes in the amount of labour input by weighted proportions of earnings. According to our computations, between 1969 and 1982 the 0.67 percent average decrease of the workers was partly counterbalanced by the favourable change in education (+0.13 percent); by the modification in the composition by age groups (+0.11 percent); and by the rising level of professional training (0.09 percent). The effect of changing proportion by sexes was minimal (0.03 percent). As a whole the quantity of labour inputs decreased – taking into account the above mentioned quality changes, too – on the average by 0.37 percent per annum.

The growth rate of gross production per working hour amounted to 6.2 percent on the average per year in the socialist industry (*Table 7*) while the output per number of workers increased "only" by an average of 5.1 percent per annum. The fluctuation of growth rate in *productivity* in the partial sections of the period can be explained by the changes in the quantities of the factors of production and by those in the output. In the mid-seventies the growth rate of production declined somewhat but the slow decrease of the workforce in the preceding years still resulted in the acceleration of productivity growth. The powerful slowdown of productivity growth experienced in 1979–1982 (the 31 percent fall in the dynamism as compared to the preceding period) can essentially be explained by two circumstances: (1) the dropping external demand for industrial output and the restriction applied consciously in order to improve the balance of foreign economy; (2) the quickening decrease of the workforce which could no more be compensated by the extension of the fixed assets.

The dispersion of the dynamism of labour productivity was insignificant even by comparing it to the differentiation in the growth rates of production. From among the branches representing a greater share within the output, the growth rate of productivity exceeded the average in the chemical and the engineering industry while that in mining, food industry, metallurgy and the light industry was lagging behind it.

We surveyed the influence exercised by the changes in the distribution of hours worked among the (sub)branches and the changes within the individual (sub)branches themselves on the growth of productivity in the whole of industry. In the period between 1968–1982 about nine-tenths of the increase in industrial labour productivity came from the improvement of productivity within the (sub)branches. The shift in the proportions of manpower (hours worked) towards the more productive branches contributed to the dynamics of productivity in the whole of industry only to a relatively small extent. (In this respect there were no differences between the particular periods.)

2.3 *The Stock and Efficiency of Fixed Assets*

The stock of industry's productive fixed assets increased annually during the whole period by 9.3 percent and in view of the dynamics of the subperiods an acceleration could be observed. Simultaneously the ratio of the assets depreciated to zero markedly increased. (In 1982 the value of depreciated buildings and equipment amounted to 15 percent of the total of the productive fixed assets.)

The development of labour productivity, asset efficiency and total factor productivity in the branches of the socialist industry (rates of average annual change in percent)

Branch	Labour productivity ^a			Fixed asset efficiency ^b			Total factor productivity ^c		
	1969–1982	by subperiods		1969–1982	by subperiods		1969–1982	by subperiods	
Mining	3.81	1969–73 1974–78 1979–82	5.51 4.64 0.72	–6.26	1969–73 1974–78 1979–82	–4.55 –5.20 –9.62	0.65	1969–73 1974–78 1979–82	2.35 1.57 –2.54
Electric power generation	7.34		8.11 8.36 5.13	–2.19		–0.34 –1.67 –5.08	0.62		2.16 1.29 –2.09
Metallurgy	4.5		5.25 5.34 2.54	–4.35		–1.6 –2.5 –9.87	0.65		2.31 1.97 –2.99
Engineering industry	6.96		6.42 8.61 5.60	–3.4		–1.65 –1.37 –7.97	4.21		4.31 5.98 1.93
Building materials industry	5.1		3.65 6.90 4.7	–5.99		–5.98 –3.81 –8.67	0.41		–0.38 2.39 1.04
Chemical industry	7.75		7.72 10.46 4.48	–3.59		–1.54 –1.79 –8.26	1.38		2.59 3.54 –2.73
Light industry	5.8		6.25 5.96 5.03	–4.79		–2.51 –5.76 –6.39	3.12		4.06 2.97 2.13
Other industry	10.25		10.56 11.38 8.45	–1.9		1.7 1.14 –7.13	8.28		9.16 9.35 5.88
Food industry	4.17		4.05 3.61 5.01	–5.12		1.64 –5.03 –9.4	1.68		2.58 1.32 1.02
Socialist industry	6.15		6.15 7.12 4.94	–4.23		–2.23 –3.18 –7.92	2.60		3.32 3.61 0.47

^aLabour productivity = gross production value per hours worked by employed persons on the average

^bFixed asset efficiency = quotient of gross production value and productive fixed assets

^cTotal factor productivity = weighted average of labour productivity and fixed asset efficiency.

The fact that the restriction on the allotment of national income to investments was only slightly to be felt in the growth dynamics of the productive fixed assets can be ascribed to two circumstances: (1) though the yearly average growth rate of investments put into operation was decreasing, this started from an extremely high level; (2) the pace of replacements, scrapping was significantly retarded.

The dynamics of the productive fixed assets' gross value by branches was lying in a narrow range, the rate of growth in the case of the chemical industry which increased its fixed assets most rapidly, was higher than average only by 25 percent, while the growth rate of fixed assets in the most "poorly" treated metallurgy was merely 16 percent lower than the average. This means that the extraordinary increase of the industrial fixed assets in its pace was not too highly differentiated among the branches. (The same applies to the sub-branches.)

The development of industrial fixed asset efficiency in the analysed period was rapidly worsening (see Table 7). Comparing the branches it can be found that in the whole period of 1969–1982 the worsening of asset efficiency was lower than average in the engineering and the chemical industry. (This phenomenon harmonizes with the circumstance that these two branches were for a long time considered as "pulling branches" in industrial development.) In metallurgy the decline of asset efficiency was average. In the years 1979–1982 asset efficiency deteriorated at a higher than average level even in the engineering and the chemical industry and metallurgy (these were the branches where capacities were increasingly under-utilized after 1978, which, in the case of the former two, was obviously due to the forced development of their fixed assets in the preceding period).

Comparing the growth of output, the extension of fixed assets and changing asset efficiency by branches (and sub-branches), the conclusion can be drawn that *in the analysed period the dynamism of fixed asset efficiency was basically determined by changes in the pace of production* since the differences of development in the fixed assets among the (sub)branches played an insignificant part.

2.4 Total Factor Productivity

The combined effects of the aforementioned tendencies find expression in the development of the indicator of total factor productivity. In the whole period subject to the analysis industrial total factor productivity increased annually by 2.6 percent on the average. This was basically the result of the high productivity dynamics between 1969–1978, since the originally high growth rate between 1969–1973 continued to grow in 1974–1978. The contribution of total factor productivity to the increase of production was parallel to this (from 55 to 61 percent). By holding back production dynamism after 1978 the growth rate of total factor productivity decreased dramatically, approaching zero. (*Table 7*).

By analysing the development of total factor productivity, two types of development could be outlined. In most of the branches (most significant were: mining, metallurgy, light industry and food industry) the growth rate of total factor productivity began to slow down already after 1974. The trend of speeding up which

characterized the whole of industry, appeared only in two branches, i.e., the engineering and chemical industry which were the most preferred ones in the course of development. The dynamism of total factor productivity as compared to the preceding period declined most after 1978 (exceeding the average of industry) in those branches in which, owing to the restrictions on domestic consumption and deteriorating conditions in the capitalist markets, problems of marketing and unutilized capacities came about (metallurgy, the chemical and the engineering industry).

Since 1979 the growth of total factor productivity has been falling at a higher rate than that of labour productivity. The reason for this was the process of replacing labour by embodied labour, gradually accelerating throughout the whole period of our survey. (The measure of substitution in the whole period grew by 3.5 percent per annum, and the changing rates in the subperiods were 2.7; 3.4; and 4.5 percent.) The decline of the labour force meant a coercion to speed up substitution. As a result, within the increase of labour productivity the weight of total factor productivity decreased. While in the whole period 42 percent of labour productivity came from the growth of total factor productivity, the respective ratios of the individual subperiod were 54, 50 and 10 percent.

3. Conclusion

The changes of world economy in the seventies called special attention to the mistakes made in the development of the Hungarian economy and in economic policy, as well as to the problems in the system of allocating the resources and in that of evaluation. We are going to end our study by a brief characterization of the role of these factors in economic growth.

The fact that the quantity of the factors of production was becoming an increasingly severe limitation on growth was no novel phenomenon in the early seventies nor was it a new recognition that the decline in quantitative growth had to be counterbalanced by rising efficiency. This recognition was, however, not followed by a corresponding change in the economic policy, i.e., the growth-oriented system of targets and means was not substituted by a productivity- (efficiency-) centered system of objectives. In other words, the priorities of economic development strategy based earlier on quick changes in the proportions of the macro-economy and on involving considerable new resources were in fact *not* shifted to the *changes of the micro-structure* when the conditions basically changed. The radical changes of external circumstances were additional to the changes of the internal conditions. Because of the delay in taking into account these two coercive factors effectively — intertwined and orienting in the same direction —, the deficit in the balance of payments as well as to keep the process of indebtedness within reasonable limits have become, since the late seventies, the most serious concern of Hungarian economic policy.

Two circumstances accounted for the extreme slowdown of the Hungarian economy (and industry) in adjustment to the global economic changes and in noticing the need to adapt to them. One of them was that for a long time the practice of

economic development considered it a priority task to build up complete verticalities for processing imported raw materials into finished products. As a result of this, the role of direct (business) contacts for transmitting international appreciation and requirements in the particular phases of production became practically negligible. The other one was that the budgetary policy of the mid-seventies, stabilizing the domestic conditions of economic management and economic growth by taking on indebtedness, contributed to the temporary conservation of the economic structure which was already out of date in the world economy.

Among the factors causing the slowdown of economic growth the system of enterprise income regulation, the practice of allocating the resources which were even in the second part of the surveyed period stimulating extensive growth (i.e., involving as much of the factors of production as possible) played a significant part. No such conditions of regulation or environment were developed which would force and enable the enterprises to efficient management of resources and to economically reasonable combination of the factors of production. In the lack of these the change of the product structure on enterprise level, the speed of raising the technical standards and market-oriented enterprise behaviour remained far from what could have been desirable.

The analysis of mistakes in the economic and development policy of the 1970s and further development of the economic mechanism are clearly indispensable conditions of accelerating future economic growth and improving economic efficiency.

APPENDIX

Factorization of the Changes of Efficiency

The changing efficiency (labour productivity, fixed asset efficiency) of the material branches (or industry) can be reduced to the effects of changes in efficiency and in the distribution of resources within the particular material branches (or industrial sub-branches). The formula used for this in our computations was the following:

$$\frac{P_t - P_o}{P_o} = \frac{\sum_{i=1}^n (P_{it} - P_{io})e_{io}}{P_o} + \frac{\sum_{i=1}^n (e_{it} - e_{io})P_{io}}{P_o} + \frac{\sum_{i=1}^n (P_{it} - P_{io})(e_{it} - e_{io})}{P_o}$$

where

P = labour productivity, or, resp., capital productivity

e_i = the share of the i -th material branch (industrial branch) in the given resource (labour force, working hours, or fixed assets)

$$\left(\sum_{i=1}^n e_i = 1 \right)$$

o and t = the starting and the end point of the surveyed time period

On the right side of the equation the first factor expresses the change of efficiency within the branches, the second one is the quantification of structural changes and the third one represents the common effect.

HUNGARIAN INDUSTRIAL POLICY: ITS SCOPE OF MOVEMENT

BALÁZS BOTOS

In the early 1980s industry still has been playing a decisive part in the Hungarian national economy – though to a declining extent in comparison to earlier periods. Its contribution to GDP is 34 percent, and 32 percent of the working population is employed in industry. Its share in the whole of Hungarian investments amounts to 37 percent and the share in total exports is 91 percent (including food industry).

The economic results of industry in the past few years can be considered far from being sufficient despite the unquestionably positive phenomena, such as improvement in the balance of trade, maintenance of the country's solvency. We have failed in changing our position essentially in international competitiveness and even the standard of efficiency of our production has only slightly been raised. In addition to other reasons, the main role in all this was played by the fact that the answers to the basic questions of our economic and industrial policy were and are still under discussion. To what extent the various external and internal conditions influence further development of Hungarian industry, i.e., what is the scope of our movements, belongs to this category.

To analyse the dominant factors of industrial policy and the scope of industrial development is a rather important task though far not an easy one. We have to reckon with a large number of restricting factors not only in the long run but even more so in the near future. The results of these can be assessed partly accurately, while another part only approximately. In the same way, one can distinguish between limits and endowments which assert themselves generally, in the case of every country and special factors which are of prominent significance for the particular countries.

Research into the scope of industrial policy has hardly any tradition in Hungary. In developing our earlier concepts we also reckoned with our natural endowments, the development level of industry, the size of the country and so on. But we were less conscious of appreciating how severe the determination is. In the following we wish to present the results of our survey which attempted to solve this task on the basis of investment and foreign trade restrictions as examples.

The Determination of Investments

In the second part of the 1970s the growth rate declined in Hungary as well as in all socialist countries. Practically none of the socialist countries was able to fulfil their national economic plan of 1975–1980. The trend of slowdown – which, with the exception of the GDR and Romania continued even in the 1980s – was unequivocally

accompanied by lack of resources and a consequent restriction of investments. All this may give the impression that the only reason of the determination on investments has been a shortage of investment sources and — seemingly — this has to be taken into consideration to an ever increasing extent.

In reality, however, investment conditions of industrial development are influenced also by a number of other factors in addition to the reduced availability of sources, for instance, among other things, because of commitments in the material and technical sphere, funds tied up by investments commenced earlier and still unfinished.

In principle the investment fund available to the whole of industry means no limitation whatsoever for the particular branches, product groups, enterprises, etc. The share of certain projects may even grow to a significant extent, beside decreasing industrial investments. At the same time, however, the investments in progress on the one hand restrict the opportunities of the affected enterprises and on the other, increase the determination of the investment sources available to industry as a whole.

The national economic plan for the years 1981–1985 had forecast Ft 355–370 thousand millions for the development of industry.¹ This means that compared to 1976–1980 the limitation of the resources made itself felt strongly. This effect was then further strengthened by the differentiation of the branches. In order to appreciate this, it is necessary to review what objectives were formulated in the plans as main points in the development policy.

A part of the goals was of general nature and other parts more definite. Though the investments involved by the general objectives were not negligible, they did not mean any direct determination.

General objectives were for instance such as improving the efficiency of material consumption, the saving of energy, the development of the technological level, improvement of production or, respectively, the supply of prefabricated products, components and part units, etc. This meant already some amount being tied up, since the plan determined for instance that Ft 30 thousand million could be spent on implementing the energy conservation program, while Ft 9 thousand millions on realizing the program of utilizing wastes and raw materials. It was also obvious that the objectives and programs mentioned could not be realized within the plan period. And it is rather difficult to foresee what determination will follow from this in tying up time and resources in the next plan period. (It is another question whether such programs mean the true method of realizing objectives of this kind.)

The most concrete targets of development policy in the national economic plan were represented by the decisions concerning the central development programs, the major investment projects and other directly defined trends. At first let us say a few words about the determination involved by the central development programs.

The central development programs have been appearing in the national economic plans since 1968, as priorities of industrial development. Industrial management supported the preferential development of such fields where enterprises' initiatives were insufficient by the allotment of capital and other means. (Between 1971–1975 six central development programs were started: the program of utilizing natural gas,

¹According to the current official exchange rate, Ft 100 = \$ 2.15.

the petrochemical, the aluminium industry and the road vehicles programs, the program of the production and use of computers and the program of promoting constructions using light metal structures.)

All of the programs were based on the rapid growth of production and in setting their aims the demands of the CMEA market were kept primarily in mind, similar to the energy sources and raw materials. The dollar markets played a lesser part in these aims, although in certain fields (e.g. computer techniques) import substitution was an important criterion.

Owing partly to the decreasing number of priorities and partly to the inadequate functioning of the central development programs as tools of industrial development, at present the number of the priority programs has significantly decreased. Parallel to the finishing of the earlier ones, two novel programs were started, namely the one of manufacturing drugs, plant protection and intermediary substances and the central development program of manufacturing electronic components. The substantial aim of these programs is to restore the equilibrium of foreign trade (by import substitution and extension of exports). At the same time they can be realized with less subsidy than earlier and by a greater share of efforts on behalf of the enterprises.

Despite the foregoing the investment sources tied up by these programs are not negligible. An accurate measure cannot be defined since in their implementation both major investments (i.e., state investments) and enterprise investments take part. However, certain approximative computations can be made.

In Hungarian practice, according to the competence of decisions, three types of investments can be distinguished:

- major individual investment projects (government decisions, implementing certain significant investment projects)
- so-called lump-sum investments (also government decisions, e.g. about the development of a particular sphere of the infrastructure)
- enterprise investment (which are, of course, realized not merely from enterprise resources).

By attempting to summarize the limitations which appear in the investments belonging to the various categories of decision-making, the following picture can be drawn (*Table 1*).

The foregoing mean that between 1976–80 32 percent of the investment possibilities of industry and between 1981–85 35 percent had to be spent on finishing investments started in earlier periods. By now it is also well known that certain major investment projects started between 1976–80 will be finished after 1986.²

All these are signs of significant limitations in the scope of movement with respect to investments. The determination of the stock of fixed assets is closely linked to these limits. The fixed assets – depending on the character of production, on technology and on other technical parameters – determine what and how much can be manufactured. Though the flexibility of these limits may change in the function of the

²According to preliminary computations the value of investments running through from the sixth five-year plan period will be about Ft 65 thousand millions. Approximately Ft 55 thousand millions will be spent in the years 1986–87.

**Industrial investments commenced in the period 1976–1980
running through into further periods**

million Ft

	1976–80	1981–85	1986–1990
Major investment projects	54.824	91.209	37.470
Lump-sum investments	8.597	3.415	–
Enterprise investments	53.924	32.730	–
Total	117.345	127.354	37.470
In percentage of the total investments of the plan period	32	35	–

Source: Own computations based on the data of the Ministry of Industry.

convertibility of production capacities and the diversification of production – still, they are limits. They delimit namely not only the volume and structure of the output but also the resources that can be utilized. One of the purposes of investments is e.g. to resolve the determination embodied in the fixed assets. At the same time, the age-composition, the branch-structure, etc., of the stock of fixed assets influence decisively the direction of using the investment funds by the demand of replacement. For instance, according to the computations of I. Berend, between 1986 and 1995 such great a proportion of replacement will become necessary in the manufacturing industry that will tie up a very significant part of total investments in the given period.

By suming up the experience, it may be seen that industrial policy must – more consciously than so far – reckon with the limits of the scope of industrial development caused by the determination of investments: where it is possible, it would be needed to determine the uppermost limits of determination. It is an important requirement, at the same time, that the narrowing investment opportunities of industry should be counterbalanced by reducing the measure of determination. The possibility of this can be created by decreasing the number of major investment projects, by restricting central division of the resources and by anything in further development of the economic mechanism considered as a task serving for separating the functions of economic management and capital ownership.

Possibilities and Limits of Adjustment to the World Economy

The interdependence between the increasing difficulties of the Hungarian economy and the problems of foreign trade relations is obvious to anybody today. Since the mid-1960s economic policy has made it known that besides the well-known

importance of the CMEA markets we cannot become independent of the conditions of the whole world market either. However, the fact is that coming to the fore of the requirement to adjust to world economy remained not much more than a declaration in the priority decisions and other elements of the economic mechanism. Our economic and industrial policies do not reflect at all that the determining effects of international tendencies on Hungarian economy have been recognized.

While in judging the necessity of an increasing adjustment to the foreign markets the standpoints can be considered uniform, the same can by no means be said about the valuation of the possibilities and limits. According to one opinion the problems of the Hungarian economy are stemming from the pressure of external limits. The unfavourable development of the international political situation, the increasing number of the limits set by trade policy and the common effects of varying market conditions create the basis of the problems. Since these conditions can hardly be influenced by us, the solution is – according to this standpoint – to make the economy as far as possible independent of the above mentioned conditions. This means a forced closing of the economy, i.e., minimizing the turnover of foreign trade.

According to the other standpoint the decisive parameter of our adjustment to the world economy is the competitiveness of the Hungarian economy. The roots of the present insufficient competitiveness are hidden by the deficiencies of the economic mechanism. Thus, the basic limits of making headway and of the scope of movement are inner ones, that means that they can only be strengthened or weakened by ourselves. There are, of course, some barriers we cannot surpass, yet the solution can only be the strengthening orientation towards foreign markets.

The surveys conducted by the Research Institute of Industrial Economics regarding the characteristics and possibilities of Hungarian industry's orientation to foreign markets support the reality – or, more accurately, the logical necessity of the second opinion. The analysis, based on the data of industrial exports and imports, confirms that low efficiency of our adjustment is caused further on by problems of a structural type. The tendencies in the distribution of exports by branches may be mentioned as examples for this.

The branch structure of total industrial exports shows in essence a favourable picture. The outstandingly high share of the engineering branches conforms with the characteristics of the export structure of advanced industrial countries. Endowments of the country in primary energies and minerals, of course, delimit the volume of such exports; and a background of advanced agriculture and the related natural endowments justify the high ratio of food industrial exports.

But we can approach reality much more by surveying separately our foreign trade with each of the CMEA countries accounted for in Rbls and the characteristics of the turnover transacted for dollars. In this way the picture is much more differentiated and much more unfavourable in several respects. Regarding the proportions of the various branch groups, highly significant differences appear between the two types of markets.

The marks of a favourable export structure appear in the Rbl exports in which the share of the machinery is almost 60 percent. This is, of course, accompanied by a relatively low share of exports of the basic branches of the food and the light industry.

In the turnover for dollars the share of the engineering industry is scarcely higher than half the share in the Rbl exports. At the same time the ratio of the basic branches (which is the largest group of exporters) is almost twice and of the food industry almost two and a half times the ratio of them found in the exports paid for in Rbls. This shows a rather out-of-date export structure, since, in the majority, the basic branches export raw materials and semifinished products and even the food export does not represent the most progressive direction of adjustment.

Examining the "progressivity structure" as applied in international statistics the situation is similar. Four categories can be distinguished here. The industries based on raw materials are the extracting industry, food industry, certain branches of the chemical industry (organic and non-organic chemical industries, fertilizers) the wood-processing and paper industry. Classified as traditional industry is the light industry (except woodprocessing). A significant part of the machinery is in the „modern" category and among the progressive industries the electronic industries, some other branches of engineering and biotechnology can be reckoned with.

According to the above categories the investigated export structure shows the following picture:

Table 2

The distribution of industrial exports by groups of branches in 1982

Branch group	Rbl exports		Dollar exports	
	in million Forint	in percent	in million Forint	in percent
Of raw materials	20.261	15	47.860	36
Traditional	44.528	34	53.670	40
Modern	36.392	28	17.763	14
Progressive	30.224	23	13.202	10
Total	131.405	100	132.495	100

Source: Own computations based on statistical data.

This approach also confirms the earlier picture according to which an up-to-date export structure of the deliveries to Rbl markets stands in opposition to the dollar exports which reflect a rather outdated structure of the industrial background. While the exports of the modern and progressive branches together account for more than 50 percent of the Rbl exports, the same ratio within the exports to markets paying in dollars is only 24 percent. Accordingly, taking the two other categories into account, in those the proportion is 76 to 49 percent.

The same can be said about the composition of exports by the degree of processing as about the structure according to branch categories. As regards the picture as a whole it is relatively favourable but breaking it down to components by markets it is far from satisfactory. In the total of exports the greatest – almost 40 percent – is the share of

complex finished goods, i.e., of the products on the highest level of processing and the smallest is that of the raw materials and energy sources. Since the ratio of the uncomplicated products in the secondary stage of processing also reaches 20 percent, the two product groups representing the highest degrees of processing show a ratio higher than 60 percent, which is quite significant.

Approaching the dollar exports in the same way give a much less favourable picture. In this relation the greatest volume, almost 40 percent is that of only simply processed raw materials. Together with the categories of the semifinished products and components the export of products on lower levels of processing account for 56 percent of exports paid for in dollars, while the share of the two categories representing higher levels of processing is about 44 percent.

Further structural disproportions might also be mentioned in connection with industrial exports but the characteristics of the import structure should not be left out of sight either. In addition to these doubtlessly severe internal limits, of course the role of the selling conditions in the foreign markets cannot be denied either. We should count with further 'hardening' of the conditions in the Western markets and also with the circumstance that the terms of trade will be further deteriorating even in the markets of the CMEA. It is a fact that finally the developing countries' cost advantages also aggravate our position in these markets. However, all the foregoing may not necessarily lead to the conclusion that our scope of movements is absolutely limited. On the basis of what we said, in my opinion it depends on ourselves how far we will be able to cross over the market limitations.

As a matter of fact, determination by external economic conditions is not characteristic only of the Hungarian industry. Most of the small countries have to reckon with the bounds which limit their scope of movement in the foreign markets. But among the small countries some positive examples can also be found which confirm that the disadvantages given by the orders of magnitude can, to a certain extent, be compensated. The more so, since there are such factors as well of implementing industrial policy in respect of which the opportunities of decisions are ever widening. For example, in respect of arranging the frameworks of organization or in regulating central interventions.

Summarizing what has been said, regarding the development of Hungarian industrial policy and the determination of its scope of movement I should like to stress the following points:

- It is needed in the future to count much more consciously with the determination of the scope of industrial development and where it can be influenced to define the permissible uppermost limits of determination.
- When marking out the time period of the concepts of industrial policy it must be taken into account that owing to the interdependence of the degree of determination and the time factor, by lengthening the time, determination will decrease, while the uncertainty of the purposes will grow.
- The narrowing opportunities of industrial investments have to be counter-balanced by diminishing the measure of determination.
- In the adjustment to foreign markets internal limitations are decisive.

Consequently, there is no realistic alternative to the path of export oriented development.

– The various limits unequivocally show the necessity of such a long-term industrial development policy which considers competitiveness in the world market the fundamental criterion of development. On the basis of this policy our market position in the CMEA countries may also improve.

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PRODUCTION COOPERATION IN THE HUNGARIAN ENGINEERING INDUSTRY

JÁNOS STERNTHAL

Under the present circumstances of industrial economic management in Hungary relatively smaller amounts are spent on increasing fixed assets and on new investments aimed at creating an industrial infrastructure which may provide more flexible adjustment than in earlier periods. Hence, the potentialities available for increasing efficiency flexibility and consequently competitiveness without significant material inputs which were so far utilized insufficiently are gaining increasing importance. In our experience, among these possibilities the issues of division of labour and within this cooperation play a role of high priority.

In order to avoid the effects which impede deepening the division of labour a fundamental precondition is to become acquainted with the role and weight of the various forms of the division of labour. However, regarding the numerical weight and the influencing factors of cooperation only very scarce – and hardly accessible – data are available. Therefore in the course of our survey we carried out investigations including the enterprises of the engineering industry. By doing so we wished, on the one hand, to recognize those statistical characteristics of production cooperation between industrial enterprises about which no data were available till then (e. g. its weight, features, composition, etc.), and, on the other, we also investigated some factors which are hardly quantifiable, or could only be characterized by estimation.

From among the several possible forms of cooperation we have focussed our survey on cooperation of production among the domestic industrial enterprises.

In our survey we considered it as cooperation if (for the production of some industrial products) independent producer companies introduced a certain division of labour and the products, manufactured in the framework of the collaboration, could not be used in themselves since they constituted a part of some end product turned out by the partner enterprise. We based our analysis on the 1980 data of the enterprises under the supervision of the Ministry of Industry, collected by questionnaires. In addition, we also investigated the development of production cooperation between 1974 and 1980.

The Proportions of Cooperative Activities

The enterprises involved in the survey represented about two thirds (67 percent) of all the enterprises of the engineering industry. On the basis of production value the re-

presentation is even higher (76 percent), owing to the fact that in its majority our sample contains enterprises with a higher than average output.

The results of our investigation confirm that production cooperation plays a significant part in the production of the vast majority of the engineering companies. In 1980 deliveries of cooperation both supplied and received amounted equally to 20 percent of the gross production value. At the same time, between 1974 and 1980 the weight of cooperation within the gross production had been growing, that is the amount of cooperation increased more rapidly than that of the whole production. It is characteristic that a decisive part of the enterprises participating in cooperation (79 percent) simultaneously supplied and received deliveries in the framework of their cooperation activities. (See *Table 1*).

If we disregard the question whether the cooperation was supplied or received and consider what the share of the total amount of cooperation within the production value of the enterprises is, it is seen that in the period investigated — in the whole group of enterprises — the activities of cooperation increased somewhat, the share of these within production grew from 35 to 40 percent.

Table 1

The value of cooperation products as percentage of the total production value by subsectors

Subsector	Value of cooperation products			
	received		supplied	
	as percentage of total production value			
	1974	1980	1974	1980
Manufacture of machinery and equipment	8	14	13	22
Manufacture of transport equipment	29	28	26	37
Manufacture of electric machines and appliances	11	13	19	11
Telecommunication and vacuum technology	7	5	2	1
Precision engineering	9	11	16	10
Metal wares	11	12	21	14
Engineering industry total	17	20	18	20

As regards its organizational structure, engineering industry in Hungary includes six subsectors. A survey by subsectors shows considerable differences, in four of the six subsectors the ratio between cooperation and production declined and it increased only in two (i.e., in the manufacture of machines and equipment and in that of transport equipment). The weight of the latter ones was so high that it

resulted in an average increase of the cooperation/production ratio. The weight of cooperation was the smallest in the industry of telecommunication and vacuum technology (6 percent) and the highest in the manufacture of transport equipment (75 percent).

In the differences certain particularities play a significant part. Among the six of them the investigation showed great differences in respect of the product pattern, structure of manufacturing, technology, materials, dimensional accuracy and so on, whereby also their requirements and possibilities in cooperation are basically differentiated. The organizational system of the engineering industry is also a factor in the varying weight of cooperation in addition to the subsectoral characteristics. The proportions of external cooperation among the enterprises are also determined by the limits set to the production of the given economic unit.

In the early sixties significant reorganizations and enterprise mergers were carried out in the Hungarian industry which again influenced markedly the weight of cooperation. The mergers of companies were mostly horizontal. This often meant that enterprises having no production relationship were united so that in the given branch – or subsector – frequently only one large enterprise was created, obtaining monopoly position.

Vertical mergers occurred, too. In these cases it was hoped to provide better ways of cooperation. Several enterprises were amalgamated expressly for the purpose of transforming external, inter-enterprise cooperation into collaboration within the company.

In the course of the mergers a lot of small and medium-size plants were closed down and incorporated into large enterprises. The lack of small- and medium-size enterprises destined to produce components and part units can mostly be attributed to these measures.

In addition to the enterprise organization system, there is a strong correlation between the standards of commercial supply and cooperation. Namely, relevant analyses (8) indicate that – owing to the shortage of supplies of commercial stocks – a great number of components and assembly units are purchased in the framework of cooperation while in the more advanced industrial countries these can directly be purchased on the market.

The data based on a categorization of enterprises by size, according to the extent of production, demonstrate the weight and significance of cooperation from another aspect. (See *Table 2*.)

The data of *Table 2* unequivocally reflect the trend that the ratio of cooperation within production – including cooperation products both received and supplied, as well as the total – increases with the growing size of the company.

The smaller firms in general pursue less cooperation activity than the larger ones. This means that owing partly to their smaller volume of production possibilities for cooperation are rather limited here. The cooperation difficulties of the surveyed enterprises were usually emerging primarily linked to purchase orders for smaller quantities of products raising unique or more specific requirements.

On the other hand, the narrow possibility of offering cooperation is caused by the fact predominantly that the majority of even the small enterprises is not specialized

**The weight of cooperation within the total production value
by categories of enterprise size, in 1980**

Total production value mFt	Percentage of		
	received	supplied	total
	cooperation products in total value of production (percent)		
below 500	6.3	1.7	8.0
501 –1000	7.3	8.6	16.0
1001–2000	13.3	21.1	34.4
2001–5000	10.4	11.7	22.1
Over 5000	27.1	23.3	50.5
Total	20.0	20.0	40.0

for meeting the cooperation demands of other enterprises. These, too, are mostly prepared for producing end products and undertake cooperation activity only occasionally. The reason for this is the prices of end products being much more favourable than those of component parts. On the other hand, the smaller enterprises are afraid of losing their independence. In the past years it frequently happened that large enterprises incorporated their cooperating partners.

In regard to the weight of cooperation, appearing by size categories of enterprises, no significant change occurred during the analysed period. The cooperation activities of only the smaller enterprises narrowed to a certain degree, primarily in the sphere of cooperation products delivered. This confirms the earlier experience that the smaller enterprises, as far as their specialization and capacities are concerned, still do not fulfil the task to support flexible adjustment by supplying large enterprises and partly by serving as a background for them. The data reflecting the distribution of sales of the smaller enterprises also contribute to this finding for according to them, – in addition to the shortage of cooperation – the small firms sell relatively little quantities of components and part units to commercial organizations.

Investigating the division of production cooperation by the amounts received and supplied, it can also be stated that in 1980, as a whole the engineering enterprises supplied somewhat less in cooperation than they received. (See *Table 3*.)

Significant changes occurred in this sphere in the past years. The proportions of cooperation acquired and supplied to one another changed in comparison to those recorded in 1974. This calls attention to a modification in the behaviour of the engineering industry in respect of cooperation. In the foregoing we have presented in detail that the proportions of the received and supplied cooperation have grown. Hence, readiness to cooperate has increased from this point of view, a fact also indicated by the slightly widening sphere of the cooperating enterprises.

The changing proportions of received and supplied cooperation also show that production cooperation of the enterprises shifted towards cooperation received.

Table 3

The division of cooperation by deliveries received and supplied as percentage of the total cooperation (percent)

Subsector	1974		1980	
	Received	Supplied	Received	Supplied
Manufacture of machines and equipment	37	63	38	62
Manufacture of transport equipment	53	47	51	49
Manufacture of electric machines and appliances	38	62	56	44
Telecommunication and vacuum technology	77	23	84	16
Precision engineering	37	63		
Metal wares	34	66	46	54
Engineering industry total	47	53	51	49

Namely, in 1974 within the total of cooperation the share of that received amounted to 47 percent and by 1980 this ratio increased to 51 percent. This may partly be attributed to the fact that the cooperation background of the engineering industry grew wider and more reliable. But according to practical experience it was also partly due to the fact that self-supply, regarding engineering matters, has strengthened in other enterprises. Considering it on the enterprise level it also means that the contacts of cooperation deliveries between the average engineering enterprises and enterprises of other branches became looser. Looking at it from another aspect, it means that the companies belonging to other branches of industry grew more independent of the engineering industry in this respect.

Proportions of the Products in Cooperation

From the view of economic management of the enterprises it is not negligible what the share of those products is to which, compared to their value, a lesser or greater quantity of cooperation is needed. In the experience of the enterprises troubles with even a relatively small volume of cooperation can essentially hold up the whole process of manufacturing. *Table 4* demonstrates the ratio of the products manufactured by involving some kind of cooperation within the total number of products and the share of the enterprises which require cooperation.

According to our survey, the sphere of enterprises which require cooperation has practically not changed in the totality of the enterprise group during the analysed period: the share of them was 94 percent in 1974 and 95 in 1980. By subsectors, however, the picture is much more varied, the share of the enterprises using coopera-

tion decreased in three subsectors, in two it remained unchanged and in one subsector (precision engineering) it increased.

Table 4

The weight of cooperation received on the basis of various characteristics

Subsector	The ratio of enterprises acquiring cooperation		The ratio of products containing cooperation received	
	percent			
	1974	1980	1974	1980
Manufacture of machines and equipment	100	88	99	67
Manufacture of transport equipment	100	100	79	78
Manufacture of electric machines and appliances	80	85	83	58
Telecommunication and vacuum technology	100	100	84	91
Precision engineering	78	100	72	42
Metalwares	92	90	65	60
Engineering industry total	94	95	73	58

The situation is again quite different with the changing proportions of product types manufactured by involving some cooperation. Linked to these types of products two further features of cooperation can be established: on the one hand, the enterprises resorted to cooperation for the majority of their products (58 percent) even in 1980 and, on the other, the weight of cooperation measured on the basis of product types exceeds the weight calculated on the basis of production value and the value of cooperation deliveries received, in any of the surveyed subsectors. At the same time, in comparison to an earlier survey of ours, this ratio shows a considerable (15 percent) decrease.

This process has already been observable since 1970. In that year the share of product types manufactured by resorting to cooperation was 77 percent, it was 73 in 1974 and 58 percent in 1980. This trend, taking into consideration the increasing value of cooperation production and its increasing share within the whole value of production, means on the one hand that cooperation becomes concentrated to an ever narrower sphere of products at a more and more rapid rate and, on the other, that the cooperation content in the products manufactured by the involvement of cooperation is increasing, too (it increased by about 55 percent between 1974 and 1980).

The Character of Cooperation

In the course of classifying the cooperation relations — in line with earlier researches — we distinguished two basic types: cooperation based on specialization and cooperation for supplementing production capacity. Therefore, when examining the character of cooperation, the first question put was whether the cooperation acquired was one for supplementing production capacity or one of a specialized nature. By specialized cooperation we mean the case when an enterprise purchases various components, part units, tools, appliances, etc., from other plants, specialized expressly in the production of such products. And we speak about supplemental cooperation when a manufacturer of some types of products undertakes a production task greater than is able to perform on the basis of its own resources (production capacity) (*Table 5*).

Table 5

The types of cooperation received

Subsector	Distribution of values received by cooperation by types of cooperation; percent			
	supplemental to capacity	special- ized	supplemental to capacity	special- ized
	1974		1980	
Manufacture of machines and equipment	67	33	52	48
Manufacture of transport equipment	38	62	15	85
Manufacture of electric machines and appliances	26	74	84	16
Telecommunication and vacuum technology	95	5	52	48
Precision engineering	34	66	60	40
Metalwares	23	77	36	64
Engineering industry total	40	60	29	71

The data of *Table 5* demonstrate that in the whole group of the examined enterprises cooperation aimed at supplementing their capacity represents a smaller share (29 percent) than that of specialized character (71 percent). At the same time, the cooperation of a specialized character shows a certain increase, as since 1974 the share of such relationships has grown from 60 to 71 percent. However, in the present circumstances of the Hungarian economy this does not mean genuine specialization, i.e., the given kind of cooperation is not rendered by production units specialized in a few types of products manufactured by similar production technology: it is rather due to the fact that certain products (or activities) are brought about by certain enterprises of the country which — independent of the nature of manufacture —

consider themselves specialists. Furthermore, in certain enterprises there may exist some redundant capacity in special machines or equipment missing at the same time from the verticalities of others.

However, a change in the character of cooperation cannot be judged unequivocally. In the background of the summarized data a significant dispersion may be found among the particular branches. The average trend emerged namely so that while in one half of the branches the share of cooperation supplementing capacity decreased, in the other half it increased. In addition, the modification of the proportions took place beside rather great differences. This points to the fact that the opportunities for developing their capacity were different and that the regulation system provided markedly different possibilities for the extensive and the intensive ways of development.

Our earlier survey showed a relatively close connection between the size of enterprises and the character of cooperation. However, according to our data of 1980, no definite trend in the character of the cooperation received can be observed by examining it together with enterprise sizes and with the weight of cooperation (*Table 6*).

Table 6

**Distribution of cooperation received by types of cooperation
as the function of enterprise size, (percent)**

Production value m Ft	Cooperation received			
	supplemental to capacity		specialized	
	1974	1980	1974	1980
below 500	61	51	39	49
500–1000	32	56	68	44
1001–2000	33	42	67	38
2001–5000	48	63	52	37
over 5000	42	20	58	80
Total	40	29	60	71

By analysing the development of the character of cooperation by enterprise dimensions, it can also be detected that the much talked-of general attitude of the Hungarian regulatory system, stimulating extensive development, can be confirmed from this side as well. Namely, the data demonstrate that the smallest and the largest enterprises reduced capacity-supplementing cooperation by about 10–11 percent, the medium-size enterprises, in turn increased it (by 9–24 percent). Since most of the enterprises belong to the medium zone, it is justified to think that the enterprise development opportunities serve mainly for increasing capacity in this sphere.

At the same time, there are signs showing that the enterprises reduced the cooperations serving for supplementing their capacities because the process of

specialization proceeded at a faster rate in other companies. As a result of this, they were able to develop in many respects such a choice of cooperation which could be considered by the receiving enterprises as supplementary to their capacities.

The Concentration of Cooperation

We examined the proportion of cooperation carried out with the five largest partners to the total of received or supplied values of cooperation as a characteristic of concentration. According to our findings more than half (58 percent) of the received cooperation comes from the five largest suppliers and two thirds of the cooperation supplied is directed to the five largest purchasing partners. (See *Table 7*.)

Table 7

The concentration of cooperation

Subsector	Share within the total of deliveries			
	purchased		supplied	
	by the five greatest cooperating partners (buyers or sellers), in percent			
	1974	1980	1974	1980
Manufacture of machines and equipment	84	60	79	66
Manufacture of transport equipment	69	67	80	77
Manufacture of electric machines and appliances	61	56	50	55
Telecommunication and vacuum technology	54	42	93	78
Precision engineering	47	50	81	70
Metalwares	52	57	45	62
Engineering industry total	66	58	69	73

According to the results of our survey, the concentration of cooperation was also changed by 1980. The average weight of the deliveries from the five greatest partners decreased quite significantly (from 66 to 58 percent) in the sphere of the investigated enterprises. Presumably the fact that more enterprises offer themselves as cooperation partners than earlier both in the engineering and other industrial branches plays a marked role in this. On the other hand, it is very similar too, that the enterprises acquiring cooperation are striving to reduce dependence on their supplying cooperation partners, therefore they do not concentrate to only a few partners.

In respect of cooperation products supplied contrary changes can be witnessed. In

view of deliveries performed by the engineering enterprises the weight of the first five buying partners somewhat increased. In opposition to the former almost uniform process of "deconcentration" by subsectors, concerning cooperation of supplying the products the picture is by far not as uniform as that. Concentration measured in such breakdown decreased in four cases and grew higher only in two, the latter causing increasing concentration in the engineering industry.

The results of our survey indicated simultaneously that with the declining number of cooperation partners the permanence of relationships among the partners increased to a certain degree.

According to the answers given by the enterprises, lasting cooperation contacts are predominant in respect of both receiving and supplying the products. It has been characteristic of the changes in the analysed period that the share of cooperation contacts on a single occasion remained on the earlier rather low level, the number of repeated contacts even decreased but shifted in the direction of permanent cooperation contacts (*Table 8*).

Analysing the duration of cooperation by separate subsectors shows that in every branch continuous relationships are predominant.

This tendency, however, cannot be considered everywhere as unequivocally favourable. For example, the changing structure of production in the subsector of manufacturing machines and equipment necessitated the creation of a significant new sphere of cooperation. To a certain extent this is also reflected by the data: this is the subsector where the share of single-time contacts is the highest. The number of the partners, however, did not grow at the rate it might have been expected.

Table 8

Characteristics of time in the cooperation contacts

Cooperation characteristics	Distribution of values in cooperation			
	received		supplied	
	1974	1980	1974	1980
	percent			
One-time	4	5	2	3
Recurrent	20	17	9	4
Continuous	76	78	89	93
Total	100	100	100	100

The cooperation contacts hardly expanded, the proportions grew rigid, practically a rather exclusive sphere was created. One group of the permanent partners includes the small enterprises, cooperatives where the level of technology is raised by the large enterprises resorting to cooperation with them by granting them technical support, materials, handing over machines and equipment. However, these types of lasting contacts can only partially overbridge the gaps caused by the lack of developed background production to industry, since they come into being mostly spontaneously,

linked to just emerging demands. These "outworking" plants, manufacturing for the most part background products, are not prepared for the perspectives of covering the demand in their special sphere of trade, nor are they enabled to do so, owing to their relatively limited technical-technological capacities.

The other part of the permanent partners consists of the specialized enterprises which are in general better equipped for special tasks of technology. But such specialized enterprises are rather rare at present and the majority of them does not represent a marked share in the field of manufacturing given products or pursuing given activities.

The Directions of Cooperation

For the evaluation of the cooperation contacts an essential criterion is to see where the cooperation is directed to and where it is acquired from. Earlier our survey included only the main relations. Distinctions were made by cooperation within the engineering industry, cooperation involving other branches of industry, and cooperation activities pursued with companies of foreign (capitalist or socialist) countries. (Table 9).

Data of Table 9 show that the greatest partner in cooperation of the engineering industry is engineering industry itself; more than 71 percent of all cooperation received is performed within the engineering industry. Other domestic sectors of

Table 9

The direction of cooperation

Sources/users of cooperation	Sources of cooperation received		Users of cooperation supplied	
	percent			
	1974	1980	1974	1980
Hungarian engineering industry	60	71	46	39
Other branches of the Hungarian national economy	33	21	18	10
Foreign countries, total	7	8	36	51
of which:				
socialist countries	3	2	26	38
capitalist countries	4	6	10	13
Total	100	100	100	100

the national economy are significant rather as sources of cooperation, their share as suppliers is larger than the role they play as receiving partners. There are signs,

however, which predict that the weight of cooperation managed with enterprises of other branches will grow in the future. Establishing the Ministry of Industry (by recent merger of branch ministries) brought about an approach among the so far separated fields of engineering, heavy and light industries, and so on, and by creating uniform interests and regulation, growing possibilities of collaboration may also be expected.

Analysing the weight of foreign cooperation contacts calls attention to an essential contradiction in the cooperation relations. While in cooperation acquired, that coming from abroad is not too significant, amounting to 8 percent of all of the cooperation activities, at the same time cooperation directed to foreign partners is considerably higher: more than half of total cooperation supplied goes abroad. Hence, cooperation deliveries to foreign partners are the multiple of those received from them. Therefore it has to be emphasized that international cooperation should be considered as an expedient source for purchasing, even though the new price system stimulates the export of goods and, within this, the delivery of products for further industrial use or reprocessing, in the framework of cooperation more than earlier. Regarding cooperation dynamics by relations, in the past six years a slight increase in the weight of the domestic engineering industry and a decline in the share of other national economic branches are characteristic. Changes in international cooperation are negligible.

Similar to the summary data, changes of proportions may be observed in the cooperation received; the share of the Hungarian engineering industry increased by 11 percent. This demonstrates that intensity in the engineering industry has strengthened, cooperation received plays an increasing part within the engineering industry. Parallel to this, the significance of cooperation acquired from other branches declined. Cooperation acquired from abroad changed (increased) to a certain extent.

It is worth contrasting immediately the modifications of proportions in the cooperation supplied to the aforementioned changes. Here the weight of cooperation deliveries directed to other countries increased suddenly; within this the share purchased by the companies of socialist countries has to be emphasized since it increased from the earlier 26 to 38 percent. From the side of cooperation supplied, in contrast to that of received, engineering industry grew more open, especially in international relations. Total domestic cooperation decreased from 64 to 49 percent. Presumably the strengthening interest of the enterprises in foreign trade, primarily in exports, played an important part in the increasing share of cooperation destined to foreign countries.

Specialization in the Engineering Industry

As a rule, specialization can be characterized by the proportion of enterprises within the industrial branch. In the course of our research we attempted to approach specialization from the aspect of the products, within this, *we were striving to answer the question: which are the products representing significant shares in the enterprises surveyed and to what extent they are predominant in production.*

In our analysis we tried to evaluate specialization in the engineering industry – on the basis of the product mix – by the ratio of concentration and the proportion of the dominant products. (See *Table 10*.)

On the one hand, the results of our survey showed that the enterprises of the engineering industry pursue their production activities specializing in only a few end products. On the average of engineering the weight of the leading product is almost 30 percent in the total production value.

The following second and third products play a minor role but the first three products as a whole account for 52 percent of the whole output. Of course, essential differences can be found among the individual subsectors of engineering.

Hence, the outstandingly large weight of the few important products demonstrates that *the engineering enterprises specialized really in the manufacture of a few products*. At the same time the small shares of the following products in the total of production demonstrate that in addition to their leading products the companies produce a great number of other products. Investigating the average of the engineering industry this means that the 51 percent share of the first three products when adding the fourth and the fifth, i.e., in the case of the five together increases by 11 percent (to 63 percent) and considering the first 10 products, i.e., adding to them the products of the 6th to the 10th rank order, it increases by 13 percent (to 76 percent). In other words this means that the remaining products of the rank order which were not taken into account, represent 24 percent of the production value. At the same time, considering that the average weight of the 10th product reaches not even 2 percent (and this is decreasing with the growing numbers of the rank order), the conclusion can be drawn that beside the leading products, the enterprises are forced to manufacture various products belonging to other branches or subsectors, for the purpose of their own use, such as iron and steel castings, forged and moulded parts, metalwares, plastic workpieces, metal packaging materials, and so on. All this is, however, the result not of a conscious diversification but rather of endeavours for self-supply.

According to the index numbers presented in *Table 10*, the first ten products accounts for a little more than three quarters of total production. It is also noteworthy that the sequence of the branches is equal, according to all of the four indicators of concentration and to the Herfindhal-Hirschman index too; some deviation can only be seen in respect of the first indicator (measuring the weight of the foremost product within total production).

Thus, our surveys on product level demonstrate that – as a result of earlier actions aimed at clearing the range of the enterprises' products and supporting the specialization efforts of the enterprises – *specialization by the end products is comparatively strong in the engineering industry*. However, *since it is not built on the specialized manufacture of components and part units, specialization by end products in itself can only grant the potential advantages hidden in specialization to a rather limited extent*.

Concentration of production in the engineering industry by products,
on the basis of the production value

Subsector	Weight within the production value of the				Degree of concentration on the basis of the first ten products ^a
	first	first three	first five	first ten	
	products, in percent				
Manufacture of machines and equipment	3.65 (1)	65.8 (1)	77.8 (1)	92.1 (1)	0.1909 (1)
Manufacture of transport equipment	29.3 (4)	64.9 (2)	77.5 (2)	88.5 (2)	0.1675 (2)
Manufacture of electric machines and appliances	21.8 (5)	42.3 (5)	52.6 (5)	63.4 (5)	0.0776 (5)
Telecommunication and vacuum technology	34.3 (2)	60.7 (3)	73.9 (3)	86.6 (3)	0.1495 (3)
Precision engineering	8.9 (6)	19.4 (6)	27.2 (6)	39.2 (6)	0.0195 (6)
Metalwares	30.9 (3)	57.9 (4)	70.4 (4)	84.2 (4)	0.1437 (4)
Engineering industry total	27.0	51.8	63.4	75.9	0.1157

^a based on the Herfindhal-Hirschman index
where a_i = the ratio of the i -eth partial quantity within the total quantity. In this case, for instance, the value of this index would be one if the enterprises of the subsector in question would produce only a single product being this the greatest possible concentration.

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SPECIALIZATION AND DIVERSIFICATION IN THE HUNGARIAN INDUSTRY

ESZTER BAGÓ

A significant transformation of industry is planned in Hungary for the coming years. The background of the envisaged changes is the recognition of recent research into the organizational system according to which the present enterprise structure of Hungarian industry influences the functioning of the economy unfavourably. Industrial organization is characterized by strong concentration even in international comparison. The predominance of large enterprises and the narrow sphere of small ones results in an enterprise structure¹ which hinders the development of competition and the division of labour and cooperation among the enterprises, thus impeding a broad involvement of adaptability to the market conditions and of foundations of efficient production in the industrial organizations.

We wish to support the organizational changes deemed necessary in the Hungarian industry by rearranging enterprise frameworks by dint of central decisions. It is an additional aim to rely also on independent enterprise decisions in transforming the organization of industry. For this reason several measures were taken in the past years extending the autonomy of enterprises in shaping their own organization. (Their authority to establish companies, joint ventures, and to change the range of their products widened.) Owing to the timeliness of further development in industrial organization, the surveys which revealed the peculiarities and contradictions of the present organizational system and marked out the ways to follow, have obtained an important role in the research concerning industrial economics in Hungary. In the following we are going to present the results of a research project which fits into the line of these surveys.

In our survey we have analysed the activity structure of the state enterprise of the processing industries, – except for the food industry.² The aim of the research was to picture the degree of specialization on the level of enterprises as well as of industrial plants (i.e., within the enterprises).³ The timeliness of our research was justified by two circumstances.

¹Román Z.: A magyar ipar szervezeti rendszere (The Organizational System of Hungarian Industry). *Ipargazdasági Szemle*, 1978. 3.
Schweitzer, I.: *A vállalatnagyság* (Enterprise Size). Közgazdasági és Jogi Könyvkiadó, Budapest 1982.

²In Hungary the control and management of food industry is closely integrated with agriculture. This is the reason for having separated it from other branches of processing industries.

³The surveys on enterprise level are related to the activities of the organization units pursuing self-supporting operation within the whole industry. Those on plant level picture the activity structure of the territorially separated organization units within the enterprises.

1. When shaping the sphere of activities of the enterprises in the past decades we considered specialization and the extension of specialization one of the most important tools to improve productivity and increase efficiency. At the same time only a very few investigations covering only a very small number of sectors were carried out on the degree of specialization on enterprise and plant level; with regard to the whole of industry no such data and/or analyses were available. We have been striving to fill this gap by our survey, utilizing the data base of the Central Statistical Office, and summing up and processing the enterprise and plant data, following the points of view of our investigations.

2. In Hungarian industry the right to define the sphere of activities of a state-owned enterprise – as one of the most important proprietary issues – belongs to the state body founding the enterprise (and exercising the rights of ownership). The new provisions of law, however, which came into force in 1982, extended the autonomy of the enterprises in respect of developing the sphere of their activities considerably. Annuling the legal administrative restrictions on diversification has opened up the way towards diversified undertakings in Hungarian industry, too. As part of the research concerning the domestic conditions of diversification, our survey was also aimed at answering the question about the role of the activities outside of the main line of production in the present operational structure and the opportunities offered by this structure for the unfolding of diversified undertakings.

The Methodology of the Survey

Our survey was extended to the complete range of the state-owned enterprises of five industrial branches (metallurgy, engineering industry, building materials industry, chemical industry and light industries). It describes the activity structure of 398 enterprises on the basis of 1981 data, and also an analysis of the degree of specialization on the level of 2210 industrial plants.

In the course of our survey we considered the *product groups* as basic units in the activity structure of the enterprises. The activity structure is characterized by the distribution of the manpower employed in these product groups. The groups are homogenous groups of industrial production which can be separated technologically and to which – in general – actual groups of products and/or industrial services can be attached. Hungarian statistics started to develop the product groups within the industrial branch classification system and to collect data according to this system in 1976. In 1981 industrial activities were reviewed in a breakdown to 247 *product groups*.

According to the principles of forming the product groups the company specializing in a single product group covers a relatively homogenous sphere of needs, using a technology which cannot be converted to another product group. When activities in several product groups take place within an enterprise, they are not convertible to one another technologically and there is no overlapping between the products belonging to the particular groups. Obviously, the activity structure of the enterprise can be broken down further and the degree of specialization can be investigated deeper than

by product groups. The current system of statistical reporting, however, does not make it possible to conduct more detailed investigations, also comprising the factors of production. But the identity of technologies linking up the particular groups of products, and the separation of production equipment on the level of these, may be considered deep enough to having represented the *most important points of view of investigating specialization in the course of our survey* (i.e., the possibility of utilizing economies of scale, derived from the increased quantities and proportions of homogenous production, or the degree of concentration of material and marketing capacities).

Specialization on Enterprise Level

By surveying the activity structure of the enterprises our aim was to give a picture of *how broad the enterprises' sphere of activity is and, within this sphere, what the proportions among the particular elements of activity are*. Three methods were used for investigating the activity structure of the enterprises. First, we reviewed the *extent* of the sphere of activity by the number of groups of products included (*Table 1*). Then the *distribution* and *concentration* of the spheres of activity were investigated, according to product groups; on the one hand on the basis of the share of the group of

Table 1

The number of enterprises by industrial branches and by product groups comprised in the enterprise's activities

Branch	Number of enterprise engaged in more than				Total number of enterprises	Number of product groups within the branch
	1	2-5	6-10	10		
	product groups					
Metallurgy	1	11	4	5	21	24
Engineering industry	15	71	44	15	145	45
Building materials industry	4	23	7	—	34	21
Chemical industry	8	26	11	2	47	30
Wood, paper and printing industry	10	54	3	—	67	21
Garment industry	16	48	15	5	84	40
Total	54	233	84	27	398	—
Distribution (percent)	13.6	58.5	21.1	6.8	100.0	—

products showing the greatest proportion (*Table 2*), on the other hand by the aid of the Herfindahl-Hirschmann index⁴ characterizing concentration of the activity structure, i.e., the number and proportions of spheres of activity by a single indicator (*Table 3*).

Table 2

The number of enterprises by branches and by the share of personnel employed in the principal product group

Branch	The share of personnel employed in the product group being the first on the basis of the numbers engaged in it (percent)				Total
	up to 30	31-60	61-90	91-100	
Metallurgy	3	9	7	2	21
Engineering industry	11	64	38	32	145
Building materials industry	1	9	11	13	34
Chemical industry	3	9	19	16	47
Wood, paper and printing industry	1	40	7	19	67
Garment industry	3	27	26	28	84
Total	22	158	108	110	398
Distribution (percent)	5.5	39.8	27.1	27.6	100.0

In the course of our survey we separated the *repair and maintenance* jobs from the activities of the enterprise and examined the distribution of the persons employed *without* taking these into account. These activities account for considerable numbers of the manpower, in the enterprises involved in our research 9.7 percent of those employed were so engaged. However, the activities of repair and maintenance deserve specific consideration within the whole sphere of activities, since these groups of production *are not part of the direct production operations* but belong to the activities rendering auxiliary services to industry and as such they constitute an element of industrial infrastructure. From *Tables 1, 2 and 3* which represent the degree of specialization in the activities of the enterprises involved in the survey, as well as their extent and concentration the following conclusions may be drawn:

⁴Index "H" ($H = \sum_{i=1}^n P_i^2$) is an indicator with highly favourable features for measuring concentra-

tion. In our research the P_i values were the shares of those employed in the particular groups of products within the total number of those employed by the enterprise or in a certain plant. The value of the index is 1, if the activity of the enterprise or plant is concentrated to only one group of products.

Table 3

**The number of enterprises by branches and by the value of index H
(Based on the distribution of persons employed)**

Branch	Total number of enterprises	Number of enterprises where value of index H is				Average	Dispersion
		below 0.3	0.31–0.6	0.61–0.9	above 0.91		
Metallurgy	21	5	10	4	2	0.47	0.27
Engineering industry	145	28	71	20	26	0.53	0.25
Building materials industry	34	3	13	10	8	0.64	0.27
Chemical industry	47	8	11	15	13	0.65	0.30
Wood, paper and printing industry	67	5	37	7	18	0.57	0.15
Garment industry	84	5	40	15	24	0.68	0.16
Total	398	54	182	71	91	0.58	0.27
Distribution (percent)	100.0	13.6	45.7	17.8	22.9		

1. The data bear witness of a relatively *low level of specialization* in the sphere of activities of the companies. Altogether 13.6 percent of the enterprises specialized in a single product group, showing a homogenous activity, and it is hardly more than a quarter of them (27.6 percent) where one of the product groups take a central position within the structure of activities. On the basis of the Herfindahl-Hirschmann index which characterizes the broadness and concentration of the enterprise's sphere of activities by a single indicator the data of only 91 of the investigated 398 enterprises indicated a strongly concentrated sphere of activities.

2. Behind the aforementioned total view the data of the tables *do not reflect any significant difference between the branches*. Reviewing both broadness and concentration of the fields of activity, enterprises of most various levels of specialization take place in any of the branches. Though the averages of index H per branch show certain differences, these are not at all marked and beyond the sectoral averages the dispersion of the enterprise data is uniformly high.

The Relationship between Specialization and the Size of Enterprises

The data of our survey indicated that the wide and scattered structure of enterprise activities is a general phenomenon in Hungarian industry. Studying its background, we examined the relationship between the specialization on enterprise level and the enterprise size, i.e., the dimensional structure of enterprises.

It is customary to presume a positive correlation between the activity sphere and the size of the enterprise. In order to utilize economies of scale derived from growing production of homogenous products and their production facilities, the smaller enterprises are generally forced to a more powerful specialization and only growing enterprise dimensions open up reasonable opportunities for diversifying the field of activities. Some empirical surveys conducted among capitalist companies have also proven this correlation. The research projects reporting on diversification as gaining ground have uniformly witnessed that primarily the large enterprises are those which operate in a broad field of activities. The growth of enterprise dimensions is accompanied by broadening the sphere of activities and it is the relatively great number of small firms in the capitalist countries where powerful specialization can be found.⁵

The distribution in the size of the companies involved in our survey reflects the strongly concentrated enterprise structure of state-owned industry. *More than half, 210 of the investigated 398 enterprises (58.8 percent) belong to the large enterprises employing more than a thousand people.* The share of the firms employing 300–1000 persons is 31.1 percent and not more than 16.1 percent belong to the sphere of small-scale enterprises. Such a distribution of enterprise sizes indicates by itself that specialization of the individual enterprises cannot be very powerful in the present framework of enterprises. Owing to a strong organizational centralization of the particular branches the activities belonging to the given branch had to be fitted into the fields of operation of a relatively small number of enterprises.

Table 4 demonstrates the *distribution* of enterprises with varying concentration of activity structure by categories of enterprise size.

The above data make it obvious that:

1. In the state-owned industry *small and medium-size enterprises do not show markedly stronger specialization than that of the large enterprises.* Only 31 percent of the firms employing less than five hundred persons concentrate their activity to a single group of products.
2. For the sake of a more accurate demonstration of the relationship between the level of specialization and the size of the enterprises, we calculated the correlation between the number of those employed by the enterprise and index H characterizing the specialization in the structure of activities. Regarding the investigated area of enterprises as a whole, concentration of the activities has shown a decreasing trend simultaneously with the growing size of the enterprises. At the same time, *the relationship between enterprise dimensions and the degree of specialization* both in the whole sphere of the enterprises and within the particular branches — *has not turned out to be powerful.* (Taking into account all the investigated enterprises, the coefficient of correlation was only 0.236; nor did they show significant relationships within particular branches.)

⁵ Utton, M. A.: *Diversification and Competition*. Cambridge University Press, Cambridge 1979.
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Table 4

**The number of enterprises by size categories and the concentration
in the field of activities**

Categories of size (persons)	Number of enterprises where the value of index H is				Total number of enter- prises
	below 0.3	0.31– 0.6	0.61– 0.9	above 0.9	
– 100	–	4	1	8	13
101– 300	2	31	3	15	51
301– 500	2	26	9	12	49
501– 1000	9	36	15	15	75
1001– 2000	13	31	23	22	89
2001– 5000	17	44	18	18	97
5001–10000	7	7	2	1	17
10000–	4	3			7
Total	54	182	71	91	398

As a consequence of all this, the low degree of specialization characterizing the totality of enterprise activities is closely linked to the fact that the predominance of large enterprises is characteristic of the present structure of industry. Owing not only to their size but also to the lack in specialized small and medium-size enterprise, the large companies are forced to develop a wide sphere of activities.

Specialization on the Level of Industrial Plants

While analysing the activity structure of the enterprises by product groups reveals how broad the range of products manufactured by them is, giving a picture of inter-enterprise division of labour, by surveys on plant level specialization within the production process can be analysed in more detail. By analysing the structure of operations in the individual plants it is no more the management units of organization but the basic units of *production* on the level of which the extent and concentration of production and the degree of specialization can be investigated.⁶

It is particularly justified to distinguish enterprise and plant level in analysing the degree of specialization of the Hungarian industry, since here the enterprise structure today is characterized by a strongly centralized organization: *the major part of the enterprises include more than one industrial plant.* (Only a fifth of the analysed 398 enterprises consists of one plant and almost a third of them comprise six or more

⁶ About the significance of analysis on plant level besides that on enterprise level in studying industrial organization, see: Román, Z.: *Iparpolitika* (Industrial Policy). Közgazdasági és Jogi Könyvkiadó, Budapest 1981. pp. 110–149.

operating plants.) Thus, the activity structure of the enterprises is in the majority divided among several plants. Hence, the present organization system – even beside the relatively wide spectrum and scarce concentration of the spheres of activity – would make it possible to develop, within the structure of enterprise activity, some kind of division of labour among the plants belonging to the same enterprise and so to strengthen specialization on the level of the individual plants, i.e., the basic units of production.

Tables 5 and 6 demonstrate the activity structure of the 2210 industrial plants of the 398 enterprises involved in our survey – namely, the degree of specialization on plant level. (Table 5 shows the width of the activities and Table 6 the concentration of the spheres of activity in the plants.) According to the data of the tables the number of organizations with low specialization is relatively significant even on the level of plants: more than a fifth of them show a low degree of specialization, 480 industrial plants embrace three or more groups of products and 519 take place in the group of plants characterized by low concentration of the spheres of activities.

Table 5

The distribution of plants by branches and by the number of product groups produced by them (in percent)

Branch	The share of plants engaged in					Total
	1	2	3	4	5 or more	
	groups of products (in percent)					
Metallurgy	53.7	9.3	14.8	3.7	18.5	100.0
Engineering industry	63.9	14.7	7.9	7.8	5.7	100.0
Building materials industry	31.8	51.9	11.0	1.9	3.4	100.0
Chemical industry	71.6	11.6	6.5	3.0	7.3	100.0
Wood, paper and printing industry	45.4	13.1	35.8	4.8	0.9	100.0
Garment industry	67.6	15.4	7.8	4.1	5.1	100.0
Total	59.6	18.7	11.2	5.2	5.3	100.0

For a more accurate consideration of the above picture created about the activity structure of the industrial plants the following factors should additionally be taken into account:

1. Of the 2210 industrial plants involved in our survey 953 (43.1 percent) employ less than 100 persons; the numbers of manpower are between 101–500 in 852 plants (38.6 percent) and there are merely 158 plants where the number of the employed exceed a thousand. With such a dimensional structure the opportunity to achieve economies of scale could very likely be created by a much stronger specialization than today on the level of plants.

Table 6

**The distribution of plants by branches and by the value of index H
(in percent)**

Branch	The share of plants where the value of index H is				Total
	below 0.3	0.31–0.6	0.61–0.9	above 0.91	
Metallurgy	11.1	24.1	7.9	57.4	100.0
Engineering industry	5.8	19.5	9.9	64.8	100.0
Building materials industry	0.8	13.3	29.8	56.1	100.0
Chemical industry	9.0	9.5	10.4	71.1	100.0
Wood, paper and printing industry	2.2	40.6	7.9	49.3	100.0
Garment industry	2.1	15.8	10.1	72.0	100.0
Total	4.4	19.1	12.2	64.2	100.0

2. This assumption is well supported by our computations which have shown that only a relatively weak connection can currently be found between plant size (characterized by the number of employees) and concentration of the activity structure (demonstrated by the H index); the correlation index between the two factors was -0.337 . This means that the degree of specialization in the plants is not markedly influenced by the size of the plant. So it is groundless to suppose that the relatively broad activity spheres observed with a considerable part of the plants are justified by the dimensions of the plant.

Activities beyond the Main Line of Production

According to the results of our survey the vast majority of the enterprises (86.4 per cent) is engaged at least in two product groups. The product group representing the main production line, which is the most significant on the basis of labour force employed in it, in three quarters of the enterprises does not represent a decisive share within the activities of the enterprise. The activities outside of the principal line of products are in general rather significant; 56 percent of the manpower is engaged in product groups other than the main one.

In order to consider the activity of the enterprises beyond the main range of products more precisely we investigated them from the points of view (1) how they are linked to the basic activity; (2) if they belong to the same sub-branch as the main products or to a different one; (3) if an economic scale of production can be ensured in the product groups outside the basic range of products.

1. Not more than 186 enterprises of those involved in our survey produced every group of products within the sphere of their activities to sell them on the market. 53.9 percent of them produced at least one group which was not marketed, which

means that *this group of products is used up within the enterprise*. Among the latter, 119 enterprises had no sales in one product group, 89 in 2 to 5 groups and there were 5 enterprises which sold no goods of more than 5 product groups.

Thus, more than half of the enterprises involved in the survey developed the activity beyond their basic products for serving their own basic operation. By the additional activities these companies replaced external cooperation. This is mostly a constraint on the enterprises, since the strongly centralized structure of Hungarian industry, the lack of small-scale enterprises create no favourable conditions for widening the division of labour among themselves.

2. Within the activity structure of the particular enterprises, intertwining of the various product groups belonging to different sub-branches – since statistical distinction between the sub-branches is made on the basis of the character of the products, the production technology applied, and the market for the products, – can be considered as diversified, as vertical intertwining of the sub-branches does not play a role of the same significance as similar connections among the groups of products.

According to the results of our investigations, considerable part of the enterprises – about 80 percent – has some production capacity and pursue some activity other than those belonging to the sub-branch of their basic product line. With about half (190) of the enterprises a significant share of the operations beyond the principal range of products – more than 70 percent – are devoted to production belonging to other subbranches. On the other hand, only a fifth (87) of the total number of them are specialized to products belonging *fully* to a single sub-branch.

As the data collected throughout our survey show it, the activities alien to the principal production line of the enterprise coincide generally with those adopted by the enterprises for the purpose of fulfilling their basic tasks. The products beyond that of their main sphere of activity are either not sold at all, or the enterprises sell only a very small share of them in the market. The intertwining of the activities that belong to different sub-branches in the activity structure of the domestic enterprises show no conscious diversification strategy, but rather the lack of inter-enterprise division of labour.

3. The results of our research indicated many-sidedly that the activities of the enterprises outside the basic line of products are of a *very scattered* character. The data of the table indicate that the dimensions of activities outside the main product range can hardly reach the sizes ensuring economic production within the individual enterprises. Not more than 20 percent of them concentrate their activities to only one product group, with more than half of them the activities without the particular sub-branch are divided among three or even more product groups.

Our surveys, carried out on the level not only of enterprises but also on that of sub-branches, demonstrate a strongly scattered character of the activities additional to the basic product line. Production of the enterprises belonging to particular sub-branches falling into categories outside the sub-branch is generally divided among a great number of sub-branches; the number of those engaged in the particular sub-branch reaches only in a small part of the enterprises more than one percent of the total work force employed in the sub-branch concerned. The remaining – comparatively very small – share of those engaged outside the sub-branch is again

divided among a number of further sub-branches. Beside such distribution of the production outside the sub-branch it is hardly presumable that the dimensions of such production reach the extent needed for economic production.

Table 7

The number of enterprises by branches and by the number of product groups outside the sub-branch

Branch	Number of enterprises engaged in product groups outside the sub-branch				
	Total number of enterprises	Number of those engaged in			
		1	2	3-5	6 or more
product groups outside the sub-branch					
Metallurgy	17	7	1	3	6
Engineering industry	124	34	23	46	21
Building materials industry	29	7	7	9	6
Chemical industry	41	15	7	18	1
Wood, paper and printing industry	28	17	6	4	1
Garment industry	65	13	10	23	19
Total	304	93	54	103	54
Distribution (percent)	100.0	36.6	17.8	33.8	17.8

Summary

According to the results of our statistical survey into the activity structure of the industrial enterprises of the branches involved in the survey, they have in their totality wide and scattered activity structure. The broad sphere of activities, characteristic of the majority of the enterprises had been developed, however, not as the result of the diversifying strategy widely applied by the companies in Western countries. In the Hungarian industry the broad sphere of enterprise activities indicates much more the low level of inter-enterprise and intra-enterprise division of labour. Numerous results of our survey bear witness to this fact (the relatively low standard of specialization on industrial plant level, the low degree of specialization among the small and medium-size enterprises, the scattered character of the activities outside the main range of products, and, within the latter, the important part played by the activities assisting as services to the basic activity).

On the basis of the results of our research such changes seem to be expedient in the organization of domestic industry which boast the concentration of activities in the individual plants (and, consequently, enterprises). Opportunities for this are offered from three directions:

1. The results of our analyses show that concentration of the activity structure of the enterprises is hindered by several separate small-scale activities of little portent, which had been taken up by the enterprises in order to enable them to fulfil their basic tasks. By increasing the role of specialized small and medium-size enterprises within the company structure of industry – which would entail the development of inter-enterprise division of labour – it would be possible to diminish, or even to eliminate the constraint of self-supply. In the past years several measures were taken (dismemberment of enterprises, establishment of subsidiaries, the support of small-scale enterprises), which were aimed at decentralizing the organization of industry and strengthening the sphere of small and medium-size enterprises. The results of our research justify the necessity of such measures and call attention to the need for a more differentiated distribution of size in the enterprise structure of industry and for efforts to broaden the sphere of specialized small and medium-size companies vigorously.

2. In the current organization system of our industry large companies with several plants are predominant. Therefore the broad activity structure of the enterprises, built on a strong division of labour within them, could make it possible to achieve economical scales of production and utilization of the advantages of diversification. Our surveys on plant level have shown that the standard of division of labour within the enterprise, among the plants, is inadequate. Relieving the constraint on enterprises for self-supply would undoubtedly lead to a stronger concentration of the activities of both the enterprises and the industrial plants than today. But, parallel to that, it is also needed to help the deepening division of labour within the enterprise by emphasizing the interest in increasing the profitability of production.

3. Despite the broad activity structure of the enterprises we still cannot speak of implementing diversification strategies in Hungarian industry. The endeavours of diversification aimed at increasingly many-sided utilization of moral and material resources in the enterprises, bringing about a higher standard of structural adjustability, gained ground only to a very small extent in Hungarian industry. Since 1981 the autonomy of the enterprises has been broadening, their sphere of activity has increased considerably. The generally broad sphere of activities – as it is well reflected in the results of our survey – may be expected to open up the way for diversification. On the basis of the well-known advantages of this process in the sphere of capitalist enterprises it is obvious that concentration of the activity structure of enterprises may only be our aim in order to concentrate production, and achieve economical scales of competitive production. If built on a conscious strategy of diversification which urges the utilization of economies of scale, the broad activity structure of the enterprises encompassing several groups of products can be favourable from the view of stability and flexibility of the enterprises and of competitiveness as well.

INDUSTRIAL ACTIVITIES IN NON-INDUSTRIAL ORGANIZATIONS

ANDRÁS BÁNKY–KRISZTINA PENYIGEY

When dealing with industry, construction or trade, we usually take into consideration and analyse the activities of organizations belonging to the given branch of the national economy. We seldom reckon with the fact that sectoral classification and actual activities of the economic organizations coincide only very rarely. Classification into sectors and statistical registration of the enterprises is done on the basis of their basic function.¹ The fact that in 1980 only 65 percent of total industrial production and 58 percent of the annual workers were directly supervised by the branch ministry responsible for shaping the concepts of industrial policy (the Ministry of Industry) shows how industrial management and control is split-up in Hungary. A number of supervisory bodies and federations take part in the guidance of Hungarian industry.²

Organizations pursuing statistically well definable homogeneous activity were rather infrequent even in earlier periods. The summarized data of statistics as well as the practice followed by the enterprises indicate the generally increasing trend: virtually every economic organization pursues some kind of activity in addition to its basic function. At the same time in the production processes of any national economic branch also organizations, belonging to other branches, are involved. The production data of the years 1970 and 1982 clearly reflect this phenomenon (*Annexes 1 and 2*).

It is noteworthy that during the last ten years the weight of industrial production increased in the economic organizations working outside the sphere of industry within the activities additional to their basic function. *The economic units outside of industry represent an ever increasing part in the production of the Hungarian industry.* In 1980 in addition to the about 9000 plants of the socialist industry³ approximately 12000 industrial plants were in operation organizationally belonging to some other national economic sector. About 97 000 manual workers were employed in these plants producing more than one tenth of the gross industrial output. These non-negligible orders of magnitude and the dynamics of development are warnings that when investigating the structure of Hungarian industry and assessing its

¹By "basic function" we mean the activity belonging to the prime branches of the statistical classification system, i.e., the sectors of the national economy.

²The state-owned industry belongs to the Ministry of Industry, cooperative industry to the National Council of Industrial Cooperatives, the building materials industry to the Ministry of Building and Urban Development, food industry and the industrial plants of the agricultural cooperatives to the Ministry of Agriculture and Food.

³Socialist industry includes the state-owned industrial enterprises and cooperatives.

capacity we must not narrow down the sphere of industry to merely the economic units listed within the branch of industry.

In this paper we wish to present two sets of questions in detail. On the one hand, our aim is to give a picture about industrial operations outside the proper sphere of industry and the role played by them. On the other hand, we try to give a deeper analysis of industrial activities performed in agriculture.

The Various Types of Industrial Activities

When investigating the features of industrial activities carried out by non-industrial organizations, a number of common characteristics can be found which render it possible to typify them. Based on the extent of their intertwining with the basic function, on the various degrees of attachment, and on the contacts with industry, three types have been distinguished.

1. The first type includes industrial operations *belonging closely to the basic function of the given branch of the national economy*. Integration of these activities into the non-industrial organizations is a normal phenomenon, since they go hand in hand with the basic function (such as e.g. sand and gravel production by the organizations of water management, or printing performed by the enterprises working in the non-material sphere).

Owing to the strong intertwining with the basic function, repair and maintenance of the means of production also belong to this category. Repair and maintenance are ancillary services to the basic production and, as such, constitute a part of the infrastructure of the given national economic branch. Decentralizing them is frequently a necessary condition of continuing the basic activity, therefore they can be found in the organization of any larger enterprise, irrespective of the national economic branch they belong to.

2. *The second type consists of the industrial activities closely linked to the basic function*. The non-industrial economic units may extend their sphere of activities generally in two directions:

a) They may complement their original product range of activities by phases of industrial production preceding their basic activity. So they perform the production of indispensable materials, component parts, semi-finished and finished goods used in the course of their basic function. Some characteristic examples of this type are the manufacturing of agricultural machines by large-scale farms, doors, windows produced by the building material industry, the production of textile and garment articles for the enrichment of the choice offered by domestic trade.

b) In other cases economic units, outside industry, extend their sphere of activities to the production of industrial products which have to *follow their basic activity*. They engage in reprocessing the products produced or sold in the framework of their basic function. A typical case of this kind of activity is food processing carried out by farms, by general cooperatives of consumers and sellers and by wholesale organizations dealing with agricultural products.

3. The third type of industrial production includes the activities which are *not*

linked to the basic activity of the non-industrial economic unit in question. These mean a radically new orientation for the related organizations. Two groups can be determined within this type, on the basis of the direction of using the products:

a) Manufacturing industrial products which serve for the production activities of industrial enterprises, or rendering certain working processes for them, in the framework of cooperation contacts. This type is mainly characteristic in the large-scale farms and a small number of general cooperatives of consumers and sellers.⁴

b) Manufacturing industrial products which serve for broadening the selection of articles on the market and performing industrial services (e.g. production of consumers' articles by large-scale farms, or industrial services to the population by building organizations).

A General Survey on Industrial Production outside the Framework of Industry

The sectoral structure of industrial operations carried out by non-industrial organizations is different in the individual branches of the national economy, closely connected with the purpose of the production and the given potentialities. (See *Table 1.*) In the following, according to our typology, we are going to give a brief review of the trends of industrial production taking place in non-industrial organizations.

In 1980 more than 50 percent of industrial production, pursued by non-industrial units, came from agriculture and forestry; more than a fourth of it was produced by the building industry and 15 percent by domestic trade.

In agriculture industrial production can look back upon a past of about fifteen years and today it has reached a significant extent within both agricultural and industrial production. In 1982 6.7 percent of gross industrial production was performed by agriculture and forestry.

A decisive part of industrial production is directly linked to the basic function (e.g. food processing, wood-working). Mining and building production based on the extraction and primary processing of local materials also does not mean a radically new orientation for these organizations (types 1 and 2).

However, the major part of metallurgical, engineering, chemical or light industrial production is not linked to the basic function of the large-scale agricultural plants (farms). The share of these within the full industrial production of agriculture is much lower than that of operations linked closely to the basic activity. Many people still query these forms of diversification (type 3).

The supply offered by socialist industry left significant unprovided gaps in the fields of both productive and individual consumption. This had a stimulating effect on the development of agriculture's industrial production. Thus, the emerging demand created favourable opportunities for the agricultural plants (farms) to substitute for the activities of the missing small firms in industry and complement the choice of the products of the socialist industry.

⁴The general consumers' and sellers' cooperatives (in the following called ÁFÉSZ, by the Hungarian abbreviation), are commercial organizations, carrying out functions similar to those of the consumers' cooperatives in Western countries.

The value and distribution of the industrial activities of the national economic branches other than industry,
by industrial sub-branches

Industrial sub-branch	The value of industrial production in the branches of							
	Construction		Agriculture and forestry ^a		Transport and communication		Internal trade	
	million Forint	distribution percent	million Forint	distribution percent	million Forint	distribution percent	million Forint	distribution percent
<i>Industrial production</i>								
Electric power	—	—	—	—	—	—	5.2	0.0
Mining	19.8	0.1	752.2	1.5	—	—	—	—
Metallurgy	172.0	0.6	388.9	0.8	—	—	646.6	4.4
Engineering	5782.1	21.7	4609.6	9.1	758.1	16.7	248.7	1.7
Building materials	15281.5	57.3	502.2	1.0	28.5	0.6	319.7	2.2
Chemical industry	—	—	2924.6	5.8	—	—	279.7	1.9
Woodworking industry	2037.6	7.6	8183.8	16.2	3.2	0.1	3986.0	27.3
Other light industries	—	—	1129.3	2.2	—	—	1360.9	9.3
Other industries	1621.1	6.1	633.4	1.3	—	—	526.9	3.6
Food industry	—	—	25880.2	51.2	—	—	5111.0	35.0
Industrial services	1770.3	6.6	5498.5	10.9	3748.6	82.6	2131.3	14.6
Total	26684.4	100.0	50502.7	100.0	4338.4	100.0	14616.0	100.0

Source: Iparstatistikai Évkönyv 1981 (Yearbook of Industrial Statistics 1981) Központi Statisztikai Hivatal, Budapest 1982.

^aIn the lack of data on production value, the return from sales of industrial production.

Income regulation and strong profit-orientation of the agricultural cooperatives encouraged them many-sidedly to utilize these market opportunities as far as possible. Development possibilities and personal incomes in the cooperative sector of agriculture are more closely and consistently linked to the economic results of the production than it is in the case of industrial enterprises.

The introduction and development of industrial activities offered great opportunities to increase the profitability of operations, since in the present price system the incomes to be gained in industry are normally higher than those achieved by agricultural production. Almost every large-scale farm is engaged in some kind of industrial production. 92.4 percent of the state farms and 88 percent of the agricultural cooperatives practice industrial activities.

The food processing sections of the state farms account for 82.5 percent of the total income from industrial activity showing that these are plants of considerable capacity. Industrial services and woodworking are following them in the rank order. Food industry is the leading branch in the cooperatives too, though almost as many of them are engaged in industrial services and only somewhat less in woodworking. The numbers of industrial plants and the distribution of the returns from sales by branches are shown in *Table 2*.

*

A decisive share of industrial activity in the building industry is vertically linked to the activities of construction and assembly, i.e., constitutes their industrial background.

The large share and rapid development of industrial operations in the organizations of the building industry is closely linked to the *technical and technological development* achieved in the past fifteen years. As a result of this process a major part of traditional building is carried out in prefabricating industrial plants.

In order to assert the advantages of vertical links the large-capacity building factories and the industrial plants producing various elements of construction were established within enterprises of the building industry. In addition to the favourable effects of organizational integration certain problems have also come to the surface, since the economic situation of some building enterprises was largely influenced by the over-dimensioned industrial background and the low-level capacity-utilization.

The deficiencies of the supply of the industrial organizations constituting the background of construction in respect of quantity and assortment also acted in the direction of encouraging industrial activities. As a result of this the building enterprises tend to solve the manufacturing of products hardly obtainable from other producers and those considered as shortage goods by using their own production facilities (e.g. some part of the engineering products and building materials).

In the case of construction cooperatives, founded for the purpose of repair and maintenance of buildings, carrying on their basic function is stimulated by tax allowances. For this reason they make no efforts to increase industrial production to more than 50 percent of their output which would mean to change their classification into industrial cooperatives. Within the industrial services of the construction

The number of industrial plants in agriculture and forestry and breakdown of their returns of sales by industrial sub-branches in 1982

Industrial sub-branch	Industrial plants		Distribution of industrial returns of sales
	Number	Distribution	
		percent	
Mining	30	0.3	0.1
Metallurgy	38	0.4	0.6
Engineering	2988	27.2	19.0
Building materials industry	758	6.9	2.3
Chemical industry	618	5.6	9.5
Woodworking industry	1886	17.1	14.0
Other light industries	803	7.3	4.0
Other industries	886	8.1	3.1
Food industry	2982	27.1	47.4
Total	10989	100.0	100.0

Source: Iparstatistikai Évkönyv 1982 (Yearbook of Industrial Statistics 1972). Központi Statisztikai Hivatal, Budapest 1983.

cooperatives the repair activities rendered to the population play an important part (e.g. the repair of household equipment, or passenger cars). Owing to the low profitability, however, gradual repression of the servicing activities can be observed.

A decisive part of the industrial production in the enterprises of domestic trade consists of industrial activities linked to the commercial functions – which we classified as type 2. Beside the industrial services after the sale of commodities, i.e., the maintenance of the fixed assets, industrial production serves basically *to broaden the selection of commercial goods and for making up for shortages*. The advantages stemming from the integration of industrial and commercial operations in one organization and local processing of the collected products promoted the evolvement of food industrial, woodworking and light industrial production. The deficiency in the supplies offered by specialized industrial organizations and, consequently, the tensions appearing in the sphere of commercial supply also contributed to the fact that a part of the enterprises of domestic trade were forced to introduce production activities to replace articles in short supply (e.g. manufacturing garments of special sizes).

Industrial activity in domestic trade shows a strong concentration by sub-branches of trade,⁵ since nine-tenth of the production comes from the wholesale trade of the

⁵The specialized commercial companies are grouped into various subsectors by statistics (e.g. wholesale and stockpiling of the means of production, wholesale of agricultural products, wholesale of consumers' commodities, retail shops, and so on, constitute particular subsectors in internal trade).

means of production and the stockpiling companies, the wholesale trading enterprises of agricultural products and from the general consumers' and sellers' cooperatives.

About 60 percent of the industrial production produced by the state-owned sector of domestic trade is realized by hardly more than 10 enterprises in the trade of means of production. In this group of enterprises production has been concentrated first of all to organizations not restricted to marketing, where local processing of products is also included in their tasks. These pursue industrial operations of woodworking, metallurgy and the building materials industry in their premises, mainly serving for processing the wastes.

The vast majority of the organizations for selling the products of agriculture are cooperative enterprises and almost all of them pursue some industrial activity. Within the production of them reprocessing of the marketed agricultural products (e.g. pickling and canning) is predominant. The development of woodworking was also promoted by the problems in the supply of packaging materials, indispensable for performing their main function (e.g. the manufacturing of wooden boxes).

Within the spheres of internal trade *the share of the economic units performing industrial production is highest among the consumers' and sellers' cooperatives* (96 percent in 1980). One-third of the industrial products in internal trade is produced by them.

Industrial production of the ÁFÉSZ-s has largely been influenced by the given circumstances of the district where they operate. A part of their industrial plants has been organized to solve the disturbances emerging in the regional supplies, to fill up the "blank spots", or was built upon the local resources of raw material or labour. Eighty percent of their industrial plants pursue food industrial work as their main task; in the course of that, they carry out processing of the agricultural products procured by them, or provide their local shops with the commodities produced by themselves. The food industrial plants of the ÁFÉSZ-s perform to a great extent initial phases of processing, the choice of their products is narrow, owing to the lack of appropriate technology.

In the past few years, because of the declining profitability of trading, the interests of the ÁFÉSZ-s in broadening their industrial activities evolved to a larger extent than before. The production of industrial articles which were sold not through their own marketing network but by the intervention of other commercial organizations to consumer markets, or directly to industrial enterprises, increased. Today, however, this orientation is not yet a general phenomenon. Beside the hindrances caused frequently by the lack of means, also the rigid views about commerce and the missing entrepreneurial behaviour are retarding powers.

Extending the spheres of activities similar to the industrial ventures in agriculture is characteristics of only a small group of ÁFÉSZ-s, namely of those working in the neighbourhood of industrial centres. In remote provincial settlements the ÁFÉSZ-s provide the inhabitants with basic consumption commodities. In industrial centres and their area of gravitation, in turn, the ÁFÉSZ-s are working side by side with state-owned commercial organizations. Therefore covering the consumption needs of the population is expected from the public sector of commerce, not from them. Hence, they can shape the structure of their activities more freely. Parallel to this, the

competition of state-owned trade is also acting towards changing the sphere of their activities.

A small number of the ÁFÉSZ-s, beside the production for enriching the selection of commercial articles, produces industrial goods, components for state-owned industrial companies and for industrial cooperatives in the framework of cooperation. These activities are concentrated in the first line to jobs of the metalwares, plastics and woodworking industry. In general, labour-intensive products, requiring simple equipment, little investment and low standards of education are manufactured.

Owing to the limited material and development possibilities and the relatively low level of labour culture, collaboration of the outworking type is predominant. Another feature of the industrial production conducted by the ÁFÉSZ-s is that the production of the outworking type⁶ gained ground in a relatively broad sphere. This form of production imposes a lesser burden on the ÁFÉSZ's development sources (the shop and machines are often owned by the outworkers and even a part of transport is performed by them) and renders a better adjustment to the territorial distribution of the labour force possible.

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In the sphere of *telecommunication and transport* more than 70 percent of industrial output is stemming from the vehicle repair shops which constitute an element of the infrastructure of the branch. Within the manufacture of engineering products the production of traffic and transport equipment linked vertically to the main function is predominant. The problematic character of the supplies to the engineering organizations is signalled by the fact that the transport companies are also engaged in the manufacture of components, assembly units, tools (e.g. such as metal screws, bolts, fittings, component parts of road vehicles, etc.).

Nearly half of the industrial activity of the *water management organizations* consists of building material production intertwined with their basic functions (extraction of gravel and sand.) The industrial sections rendering services to the main activity were set up in these organizations, too, where in addition to the repair and maintenance of the equipment for water management, small volumes of special products, serving the purposes of water economy, are also produced.

In the case of organizations belonging to other material and non-material branches, activities of the printing industry as an aid to the main functions may be emphasized (e.g. making printed forms).

⁶The main characteristic of the production based on the system of outworking is that those employed (frequently women) pursue production, i.e., work with the workpieces received from the cooperative, at home.

Conditions to Perform Industrial Activities in Agriculture

The expediency of carrying out industrial operations in agriculture is questioned by several economists. In their opinion the industrial plants do not fit into the organization of agriculture although they acknowledge that, owing to their possibilities in gaining benefits, they play an indispensable role in the farms. At the same time socialist industry and industrial policy reckon with the industrial activities of the agricultural plants (farms) which are able to relieve shortage situations emerging on the market of industrial commodities of consumption. Let us deal with the most important problems which are in the cross-fire of discussions, one after the other.

1. Industrial production of the large-scale farms is mostly carried out in obsolete buildings, using machines and equipment of little value, often depreciated to zero, or having only a fictive value. The far too low level of technology prevents labour from being appropriately utilized.

2. It is a peculiarity and a contradictory phenomenon of the economic activities of the large-scale farming units that *industrial production is much more profitable than the agricultural operations* pursued with a technology considered to be advanced and on a high level of productivity. Our survey has proved that the economic results of certain farms and their industrial production are closely linked. In all of the cooperative farms investigated the units of income gained by industrial activity showed a higher profit content than those of any other branch. According to our surveys the proportion of profits to the return from sales in the industrial sections of agriculture is twice that of the cooperative industry and three times higher than the same in state-owned industry. When comparing the profits to the value of wages plus assets, the picture is the same.

The profitability being higher in industrial activities of agricultural cooperatives than that in the socialist industry can be, to a lesser degree, traced back to the differences of the price system and, to a greater one, to the differing development of the costs. When evaluating profitability it must also be taken into account that in the product structure of ancillary industrial work a large share of the products belong to the areas of free price formation.

3. Many in professional circles are of the opinion that the dynamically developing industrial sections in agriculture – owing to the varying wage regulations in industry and agriculture – draw away the labour force from the industrial enterprises which could utilize it more efficiently and unequivocally work on a higher standard of technology. According to opinions of the industrial enterprises this, "enticing" effect appeared expressly in the trades in shortage and *among efficient and skilled workers*. In fact, the gain of agriculture in the numbers of manpower was nearly 13000 in 1980 and this originated mainly from the loss in the labour force of industry and construction. Those employed in industrial work in agriculture were 25000 (36.3 percent) more in 1980 than in 1975. Their numbers approached 100.000 already in 1980, and 134.000 in 1982. The attractive power, causing the inflow of industrial labour, consisted of the work being close to the dwelling place, the working time similar to that of industry and the opportunity of higher earnings.

The problem grew sharp first in Budapest and in its zone of agglomeration where

the agricultural cooperatives set up new plants. Certain agricultural cooperatives in the neighbourhood of Budapest *can no more be considered large-scale agricultural farms*, they are rather some kind of conglomerations in which the various activities are linked up only by the legal form of belonging to the same enterprise.

Regarding the wages paid by the industrial sections of the cooperative farms and their dispersion, no data are available, therefore it is hardly possible to determine the real and accurate extent of the personal incomes. The data of the plants investigated deny the opinions about unrealistically high earnings, though our experience is that *personal incomes are much more dispersed in agriculture than in the state-owned industry*. The incomes of those working in the industrial sections of the cooperative farms come from complex sources, the incomes of leaders are relatively instable, since they depend on the economic results. Earnings of the most excellent specialists not in leading position depend on the profile, on the availability of experts, on geographical situation, and so on. The proportions of earnings in the various trades do not coincide with those in industry, this can be explained by the differing structure of trades required. Whether there is time and opportunity to join the second economy also exerts an influence on the proportions of earnings. When judging the incomes it must also be taken into account that the members of cooperatives receive various fringe benefits beyond wages and salaries. In addition, the basic incomes are *considerably* complemented by the benefits of breeding collectively owned livestock in household plots, the possibilities of purchasing produce and services at reduced prices.

4. From the view of flexibility in marketing and production the small-scale plants working in agriculture are highly differentiated. The number of industrial plants working directly for the market is small. These types of strongly market-oriented, flexible small plants pursue mainly activities of the food industry, woodworking, and some special ones of engineering and the light industries.

Most industrial plants operating within agriculture are linked more or less closely to an increasing number of industrial enterprises. It is characteristic of this group that most part of their capacity is tied up by the industrial enterprises for one or two years in advance. The small plants fill up their remaining capacity with occasional contracts, or appear directly in the market (mostly with some consumption articles).

The plants of food processing, woodworking, mining and building materials are normally linked to a single industrial company or to an organization of procurement, while the engineering, chemical, light industrial plants, and, to a certain extent, woodworking plants can be characterized by deliveries to 2 or 3, occasionally to even more industrial enterprises.

5. We compared state enterprises, industrial cooperatives and the industrial production units of agricultural cooperatives to find out the differences between them. The individual organizations were ranked from the viewpoints of prices, quality, delivery times and flexibility by the experts who were inquired.

In the almost identical rank order a general tendency can be discovered. The views are especially uniform in respect of the prices and quality. It is an unequivocal experience that the industrial sections of the agricultural cooperatives usually work for lower prices. (In certain cases, however, - especially when products in short supply,

monopoly articles, or very urgent jobs are concerned, — they ask high prices, too.) The prices of the cooperative farms, though generally depressed, still contain quite significant profits.

In the view of quality level it can be noted that the state enterprises show a higher level. This is not surprising, since they have more up-to-date technology, higher technical culture and expertise and, in general better conditions of work. When evaluating the differences in quality it must also be taken into account that *in the product range of the industrial sections of agriculture* just those products are predominant which were given up by the state-owned industrial enterprises because they were considered *hardly mechanizable, labour-intensive and uneconomical*. These factors at the same time give some explanation to the differences in efficiency.

The comparison in respect of delivery times and, as closely linked to it, flexibility is much more difficult, sometimes even impossible. Let us remember that a finished product in the industrial enterprises is the result of a much more sophisticated, complex manufacturing process and it is usually much more intricate than a simple component, assembly unit or even end product manufactured by the small industrial units.

In addition, the industrial enterprises undertake several tasks of planning, organization, manufacturing preparations, purchasing, transport, calculations, etc., which the smaller plants need not bother about. The sophisticated products of the industrial enterprises, as a rule, require several types of material inputs, components, and a number of the assembled part units come from cooperating partners. These circumstances make the process of production necessarily more difficult, slower and more risky, bringing about less flexibility and longer delivery times. By taking into account the above points of view, a more shaded comparison among the various organizations can be made.

A Few Concluding Remarks

The importance of industrial activities pursued by non-industrial organizations lies not only in the role they play in the given national economic branch, they *also influence the organization system, production structure of socialist industry, and the development of the production cooperation contact between the industrial enterprises*. A further important thing is that they also participate in providing the population with certain industrial articles.

In our opinion equal conditions of competition, equal circumstances of operation need to be provided for pursuing industrial activities to any organizations, should they belong to any of the national economic branches. This, in turn, makes it necessary to regulate activities instead of organizations and to build up the management system in accordance with this concept. The interrelations and difficulties of action, revealed unequivocally, bear witness to the effect that the industrial operations of non-industrial organizations must be reckoned with by industrial policy, since in order to make well-founded decisions the activity of these cannot be left out of view. (Let us think either of labour or income policy or questions of profitability.)

The differences in the structure and organization of industry are, to a certain extent, necessary tendencies of technological and economic development. In our days the interactions between economic activities that were earlier separated, grow stronger, the traditional views of delimitations are continuously changing. The prevailing general trend is that ever closer contacts are developing among the various economic activities.

The tensions appearing in the spheres of specialization and cooperation also play a part in the intertwining of the economic branches in Hungary. The opportunity to the evolution of industrial production in non-industrial organizations has often been created by shortages and market gaps experienced in the supply offered by industry. On the one hand, owing to the disharmony between demand and supply on the market the non-industrial organizations were striving to ensure the industrial products fitting vertically into their main function partly by their own efforts. On the other hand, they also utilized their capacity either available, or built up for safe performance of their tasks, to produce consumption goods foreign to their branches – making use of the shortages in the market. Both kinds of orientation, different from one another, need varying approach and consideration.

From the aspect of socialist industry and industrial policy it is not negligible that the industrial plants of non-industrial organizations – as a sphere of small-scale plants complementary to the production of the large-scale industry – may, in the future, fulfil important roles of covering demand in certain fields of industrial articles. The production of these organizations, making up for shortages and broadening the selection of commodities, as well as competition faced by industry, may be contributions to the improvement of supply and quality of the products and to perform smoother production either in industry or in other branches of the national economy.

It is questionable, however, what conditions are, in reality, available in the small-scale plants for efficient fulfilment of these tasks. It must firstly be considered that the *present technical and technological standards* in the plants *are mostly rather low*. The lack of development sources *makes this trend permanent*, hence, usually the manufacturing of labour-intensive products, needing little investment and easily learnt, is unfolding in these plants.

The restriction of growth possibilities of the industrial plants and the taxing away of their sources of development is unfavourable also from the viewpoint that it reduces the flexibility of the production unit, puts a brake on the evolving initiative and readiness of enterprising. Thus, exactly those properties are deprived of the possibility of development which would promote the attainment of some important goals of industrial policy by flexible organizations, constituting a background of small-scale plants to industry as a whole.

Despite the difficulties expounded, the industrial activities evolving in non-industrial branches have also brought about several favourable results, therefore our opinion is that in the current situation of the economy they play a positive role. To maintain, what is more, to develop them is justified not only from the views of industry but also by considerations regarding economy and society as a whole. We think, however, that the industrial activity of the branches outside industry will not be able to solve, in the long run, the problems arising from structural disproportions of socialist industry.

**Distribution of activities among the branches of the national economy on the basis of gross production
in the years 1970^a and 1982^b
(percent)**

Activities	Industry		Construction		Agriculture and forestry		Transport and communication		Trade		Other material and non-material activities	
	1970	1982	1970	1982	1970	1982	1970	1982	1970	1982	1970	1982
<i>Socialist organizations</i>												
Industry	93.5	89.3	4.6	4.9	0.5	0.7	1.8	1.3	6.0	13.8	2.5	1.9
Construction	0.7	0.1	62.2	56.5	0.0	—	0.2	0.4	0.4	1.5	0.4	0.5
Agriculture and forestry	2.1	5.8	10.7	11.0	62.8	70.8	5.2	4.5	2.1	5.9	1.7	1.1
Transport and communication	0.4	0.3	4.7	2.5	—	—	91.7	90.9	0.4	0.4	0.6	0.4
Trade	2.1	1.9	0.8	0.4	0.1	0.1	0.2	0.6	90.1	74.3	0.4	0.5
Other material and non-material branches	0.2	0.3	4.8	10.1	0.1	—	0.2	0.5	0.6	1.1	86.4	86.9
<i>Private sector and population</i>												
Private sector and population	1.0	1.3	12.2	14.6	36.5 ^c	28.4 ^c	0.7	1.8	0.4	3.0	8.0	8.7
Total:	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

a) Distribution calculated at current realization prices, without customs duties and differences of value

b) Distribution calculated at current producer prices

c) Includes the production of household plots cultivated by the members of cooperative farms

Sources: Nép gazdasági mérlegek, 1970 (Balances of the National Economy, 1970) Központi Statisztikai Hivatal (Central Statistical Office) Budapest 1971

Nép gazdasági mérlegek, 1982 (Balances of the National Economy, 1982) Központi Statisztikai Hivatal (Central Statistical Office) Budapest 1984

Distribution of gross production of the branches of the national economy according to activities in the years 1970^a and 1982^b
(percent)

Activities	Year	Industry	Construction	Agriculture and forestry	Transport and communica- tion	Trade	Other material and non- material	Total
<i>Organizations</i>								
<i>Socialist organizations</i>								
Industry	1970	97.3	0.9	0.1	0.2	1.0	0.5	100.0
	1982	96.7	0.9	0.2	1.1	1.7	0.4	100.0
Construction	1970	5.6	93.2	—	0.1	0.5	0.6	100.0
	1982	10.8	86.3	—	0.3	1.6	1.0	100.0
Agriculture and forestry	1970	9.0	9.0	77.1	2.1	1.4	1.4	100.0
	1982	22.1	6.8	65.9	1.8	2.5	0.9	100.0
Transport and communication	1970	3.7	9.2	—	85.1	0.7	1.3	100.0
	1982	2.7	4.1	—	91.9	0.4	0.9	100.0
Trade	1970	12.8	0.9	0.2	0.2	85.4	0.5	100.0
	1982	17.9	0.7	0.2	0.6	79.7	0.9	100.0
Other material and non- material branches	1970	1.3	5.1	0.3	0.1	0.5	92.7	100.0
	1982	1.5	7.9	0.1	0.2	0.6	89.7	100.0
<i>Private sector and population</i>	1970	6.8	15.3	66.9 ^c	0.4	0.4	10.2	100.0
	1982	10.0	18.2	53.6 ^c	1.4	2.6	14.2	100.0

a) Distribution calculated at current realization prices, without customs duties and differences of value

b) Distribution calculated at current producer prices

c) Includes the production of household plots cultivated by the members of cooperative farms

Sources: Nép gazdasági mérlegek, 1970 (Balances of the National Economy, 1970) Központi Statisztikai Hivatal, Budapest 1971
Nép gazdasági mérlegek, 1982 (Balances of the National Economy, 1982) Központi Statisztikai Hivatal, Budapest 1984

CLOSING DOWN PLANTS IN THE HUNGARIAN INDUSTRY

ERZSÉBET VISZT

The fact that a number of enterprises working with low efficiency draw away resources from spheres where their operation would bring about higher results and benefits affects the development of economic efficiency unfavourably. In past years state subsidies were granted to a wide range of such enterprises with reference to their activity being irreplaceable and to the problems that could not be solved in the case of closing them down. Series of individual interventions secured their further operation. Liquidation of firms without successor so far did not occur, save for one or two exceptions and reorganization also only in a few instances. It is expected, however, that the number of such events will increase in the future because, owing to their limited resources, the central control agencies are forced to reduce the subsidies granted to enterprises working with inadequate efficiency.

Tensions caused by retrogression can largely be averted by getting familiar with the experiences gained through setbacks. In the lack of closings on enterprise level, the opportunity to recognize such experiences attached to the closing of organization units (plants, shops) within the enterprise is available which occur more often resulting from technological obsolescence or changes in the structure of demand.

The survey of reductions within the enterprise is justified by the very reason that the need for closing uneconomical enterprise departments will likely increase in the future. This is in conformity with the efforts of economic control and management aimed at urging the enterprises to strengthen efficiency instead of increasing their output. The economic regulators that come into force at the beginning of 1985 were modified in order to suit this purpose.

Solutions tending to close (sell, or lease) the non-profitable sections of the enterprise are expectable and desirable especially with the so-called low-profitability companies.¹

The purpose of the empirical survey summarized in the following was to characterize the closed *industrial plants* and to give an account on the actual questions connected with retrogression which engross the attention of the enterprises and economic control organs of Hungary.

¹The indicator of low profitability is a complex and uniform index on the basis of which a rank order of the enterprises can be drawn up. Its formula is as follows:

$$\frac{\text{accounting profits}}{\text{net value of fixed assets} + \text{labour costs}}$$

The sphere of the low-profitability enterprises has been regularly determined by the Ministry of Finance every year since 1979.

The main results of the research shall be grouped around three sets of questions, i.e.:

1. The character of the industrial plant abolished
2. The causes and factors which evoked the closing
3. The conditions promoting and impeding the reduction of the plants.

1. *The Character of the Closed Industrial Plants*

Industrial plants are smallest units observed by statistics and presumably the development of their number also gives some information about the fields of industry where reductions in this respect took place. At the same time we have to be cautious because the observation of the entire sphere of industry is impaired by the branches outside industry, for the data supplied by them on their industrial activities are usually given irregularly and they are not comparable to those of industry. We tried to account for this distorting circumstance. On the basis of analysing the statistics from this point of view we found that the increasing weight of the industrial activities pursued by the national economic branches outside industry has not been expressed in growing numbers of industrial plants. (The growth experienced in the industrial activities of the non-industrial branches revealed itself not in the number of plants but in strengthening the particular plants and in the *increasing concentration* of them and so it did not counterbalance the declining number of the industrial plants.²

In the sectors where *smaller organizations* are predominant (industries under the management of /local/ councils and cooperative industry) decrease was stronger – the plant numbers decreased annually by almost a hundred – while in the state industry including mostly larger enterprises no decrease could be experienced. Reviewing the sub-branches of industry this appeared in such a way that the number of plants grew less, primarily in the branches consisting of several small enterprises (see *Table 1*). This resulted in the conclusion that the larger enterprises are less sensitive to the fact that among their plants, too, there are some units which work less efficiently.³

In order to identify the closed industrial plants in more detail and to survey the causes leading to the fact of closing we conducted a survey and an assessment by questionnaires. The basis of the survey was the list of plants closed in 1981–1982, made available for our purpose by the Central Statistical Office, related to state industry. It included 208 plants for two years, 2.3 percent of the total.

One of the branches most affected was food industry, 40.8 percent of the closed plants belonged to this sector. Similar was the ratio of closed plants in the *building*

²Regarding industrial activities of the non-industrial branches see K. Penyigey: Iparunk tevékenységi és szervezeti struktúrája (The Structure of Activities and Organization in our Industry). *Ipargazdasági Szemle*, 1984. 1–2.

³It is noteworthy that the Hungarian enterprises are usually not too sensitive to the development of costs and this is why they break down the economic results only rarely to plants. See: J. Sternthal: A gépipari vállalatok költségérzékenysége (Cost Sensitivity of the Engineering Enterprises). Research Institute of Industrial Economics. Manuscript in Hungarian.

materials industry, especially in the manufacture of brick and tiles (see *Table 1*). It is worth mentioning that closing of plants occurred to a significant extent in enterprises having a great number of plants.

Table 1

Industrial plants, total and closed

	Industrial Plants		Distribution	Proportion
	Total No. in 1980	Closed in 1981–1982	of closed plants	
			percent	(2:1) percent
	1.	2.	3.	4.
Engineering	2065	32	21.1	1.5
Building materials industry	334	12	7.8	3.6
Paper and printing industry	153	3	2.0	2.0
Textile industry	289	3	2.0	1.0
Leather industry	668	2	1.3	0.3
Garment industry	1020	20	3.2	2.0
Handicraft industry	759	14	9.2	1.8
Food industry	1738	62	40.8	3.6
Total	7022	152	100.0	2.2

Correlation between the technological equipment and the closing of the plants can also be found: in the highly equipped industries of electric power, metallurgy, the chemical and the paper industry, no closing occurred. In the branches affected by closing, the per capita value of the gross fixed assets was – with two exceptions – lower than the average in industry. Within the food industry as well, the most labour-intensive sectors (bakeries, distilleries, mineral water and soda-water works) were set back and in the sectors technologically equipped to a higher standard – e.g. meat processing, vegetable oil or sugar industry – such changes did not emerge in the analysed years of 1981–1982.

The workforce of the closed plants was less than 10 persons in 43 percent of them and not more than 20 in 57 percent, thus, mostly substantially smaller plants than the average size characteristics of the given sector were closed (*Table 2*), where also the value of the fixed assets was lower, often even negligible, as compared to the average plant data of the affected enterprise.

Average numbers of labour force of the industrial plants by branches of industry in 1982 (persons)

	Average number of those employed in the industrial plants	
	in the industrial branch	in the closed plants
Engineering industry	348	38
Building materials industry	256	59
Printing industry	181	44
Textile industry	469	24
Leather industry	443	28
Garment industry	177	8
Handicraft industry	89	43
Food industry	104	26

2. The Causes of Closing the Plants

We were primarily aimed at detecting the real causes for closing the plants and to become acquainted with them we carried out investigations in the companies affected by using questionnaires. Fifty-one provincial enterprises filled in the questionnaires concerning seventy plants and twenty enterprises of Budapest were interviewed by telephone. (The proportion of the returned questionnaires was almost 90 percent.)

Going beyond the factual cases we tried to picture the standpoints of some functional and branch ministries regarding plant closings, especially the factors economic management is willing to strengthen in influencing the reductions.

In our survey we investigated the influence of three groups of factors playing important roles:

- a) the maintenance of buildings, machines and equipment (due to technological obsolescence, danger of accidents, or death) became problematic;
- b) no good conditions of economical operation could be provided
 - because of low utilization of capacity, difficulties in marketing, shortage in certain factors of production, – labour, material, machine capacity, etc.
 - emergence of costs unfavourably influencing the profitability of the enterprise;
- c) objections from the aspect of regional and local development:
 - some requirements of urban development and of the regional structure of industry
 - objections linked to environment protection.

Closing of the industrial plants is often explained by more than one factor. In the questionnaires we divided the groups of factors into 10 further categories and allowed the enterprises to mark more of them.

The factors which promoted closing acted in the particular sectors in the following ways: In *engineering* half of the cases were attributed to *obsolescence* and 25 percent to *urban development*; in the light industries *shortage of labour* played a much more important part, – in about one third of the cases it was the exclusive reason. In the *food industry* *obsolescence*, outdated technology and capacity shortage were the main reasons. In the building materials industry the *exhaustion of the sources of raw materials* were additional causes. Environment protection as a single – and thus, coercive – cause did not occur.

a) *Decreasing Physical Serviceability*

In the investigated cases obsolescence played the main part. Almost 50 percent of the enterprises marked it as the main reason for closing. In some cases it was a secondary cause linked to urban development and, as a matter of fact, all those referring to un-economical production as the most important reason stressed obsolescence, too. The average age of the buildings in the closed plants was *more than 50 years in about 60 percent of the cases* and in 40 percent it was between 20–5 years.

(We must note that in the USA after having investigated 1000 cases of closed plants it turned out that their average age was much lower, 19 years and in most of them it was 15 years.)⁴

In several cases the closing of the plants came to pass only because of physical destruction (explosion, tumbling down of buildings) and in some cases the plants had to be closed down in the wake of the supervision of accident protection regulations. However, the obsolete plants were mostly liquidated only when the production of them became replacable by the creation of new, larger, up-to-date capacities. For instance, the possibility to close a larger mass of old bakeries and flour mills came about only as the result of development projects of such types.

Though the most significant part in the closing of plants was played by physical obsolescence, to stimulate the closing of obsolete plants would be advantageous in order to accelerate the pace of economic development. Even the branch ministries acknowledge that it would be reasonable to close the obsolete factories which were, to the major part, built at the turn of the century, since despite the minimum charges on assets, the costs of production are unbearably high in them (owing to the unfavourable utilization of materials, low personal performance, low efficiency of the machines and to the high overhead). No development fund is generated and the development activity is unable to attain more than the conservation of the old circumstances; new investments could also be implemented with only a very low efficiency. Often also on behalf of industrial leaders a kind of resignation can be experienced, since the manufactured product is usually indispensable, because of domestic supply, foreign trade interests, or cooperation contacts (to cut down the manufacture of the products would make the capacity of the companies supplying the semifinished goods and processing the wastes unnecessary).

⁴Schmenner, R. W.: Every Factory Has a Life Cycle. *Harvard Business Review*, 1983. 2.

In our opinion to refer to the difficult situation gives no adequate basis for reconciling ourselves to the continued operation of such plants which the enterprises are unable to modernize. In those sectors which work with high state subsidies the central decisions regarding reduction should be considered determinant. Individual analyses must determine every time whether to renew certain sectors of production by relocation, to reconstruct the parts built a long time earlier in the obsolete companies, or complete liquidation is the most expedient.

b) *The Problems of Profitability*

The problems of profitability, deriving partly from the low degree of utilizing the capacity, partly immediately from the increase of certain cost factors, caused the closing of only about *one third* of the plants. And instances can hardly be found when low efficiency of production, influencing profitability, was the main motive.

Low utilization of the capacities may be brought into connection, on the one hand, with the shortage of labour and/or materials and, on the other, with the decrease or changing structure of the demand. For example, the market of printed textiles had narrowed by *changing fashion*, causing excess capacity in this industrial sector and forcing the management of one of the enterprises to close several plants and sell the buildings. In addition to this, in the garment and textile industry the *shortage of physical operators* has always played a significant — in some cases decisive — role.

In the manufacturing of bricks the closing of factories has been a normal attribute of development, depending first of all on the exhaustion of the material resources; the life cycle of the factories was planned by taking this into account. In the past ten years altogether 60 brick factories were gradually closed. The problems of capacity utilization caused by shortage of labour and decreasing productivity due to the quality of labour rendered it possible to keep up only a standard of production which created shortages in some categories of the products. Hence, the highest economic management tries to hinder the closing of factories which are ripe to be closed.

In several cases the closing of plants, owing to short labour and the state of the technology, was effected only when a *reconstruction program* of the sector in question had been accomplished and novel — labour saving — capacities started production. (Several such cases were met in the food and in the garment industry.)

In the course of the survey we experienced a setback in the chemical industry which was due to the *rising price of natural gas*. The issue excited large interest, for the leaders of the industrial branch did not approve of raising the price level of natural gas. They referred to the fact that all over the world its price is lower than that of fuel gas and it will question the competitiveness of the chemical industry relying on the basis provided by domestic gas sources in an even wider sphere of markets.

Sensitivity to transportation costs can mainly be found in the sectors of the food industry — as the result of the requirements of delivering great masses of products. In this connection the number of food pre-processing plants was reduced and located to the fields of cultivation, transferring the activity in question to the large-scale agricultural plants (farms) (e.g. in the canning and tobacco industry).

The high transport costs at enterprise level arise from the territorially deconcentrated plant structure. In the food industry, for instance, the major part of food industrial activities are carried out in about 1700 plants which are classified industrial, and in some further 7500 plants within the framework of agriculture.⁵ Beside the claim to rationalize transports, the creation of the conditions for optimum size of the plants should also be promoted, in plants of ten-person staff, owing to the absence of economies of scale, the efficiency of production cannot be high.

The branch ministries devote great importance to the requirement of decreasing territorial scattering, partly in order to reduce transport costs, and partly for the sake of better coordination of the activities of the plants. One of the ideas regarding the method to solve the problems is to draw up maps for the geographic perspicuity of the plants. This might be a basis for building up cooperation contacts between plants in the vicinity of each other even if they do not belong to the same enterprise.

c) The Views of Settlement and Regional Development

On the level of industry distinction should be made between the relocation of industry and the closing of industrial plants. Yet, relocation of industry has to be involved in our subject matter, since in the given region it may cause troubles similar to those of final closing – although relocation and simultaneously the new location do not cause any loss in production.

According to our survey urban development and resettlement aspects, in the course of which the authorities wanted to provide areas for living quarters, public buildings, roads, bridges, parks, and so on, appeared in three quarters of the cases when plants were closed. Prior to the investigated years of 1981–1982 in Budapest industry this factor played a more significant part since government decrees were aimed at decreasing the weight of industry and to develop some less industrialized provincial regions. The ideas at the same time served for mitigating labour shortage in the capital and to utilize the redundant labour force in the country.

From the analyses following the related resolutions of 1966 and 1975 it could be seen that both the enterprises affected as well as the branch ministries were striving to protract the implementation of the task and to fulfil it only formally. The enterprises' interest in relocation in several instances could not be raised so that bargaining for the necessary central support sometimes took several years. The executives of the ministries appreciated the tasks of marking out the plants to be relocated subsequently as rather thankless. The enterprises on the other side objected that decisions were often taken without consultation and their interests were not sufficiently considered.

Recently several analyses have been made about the development of Budapest and propositions put forward for the future connected to the elaboration of the long-term concepts. Even on behalf of industry it is considered important to return to this

⁵ Az iparon kívüli népgazdasági ágak ipari tevékenysége (Industrial Activities of the National Economic Branches outside Industry). Központi Statisztikai Hivatal (Central Statistical Office), May 1982.

task. A true dialogue, however, between industrial management and those responsible for regional development has not taken place yet. The leaders of regional development can determine exactly why continued relocation would be desirable from the view of Budapest – or any other industrial town. The wish to find the relative optimum considering both the interests of urban development and of – the increasingly important – environmental protection as well as those of industrial production is reflected in their recommendations. The method of solution, however, had not taken shape so far.

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One can also arrange the groups of plant closing according to the degree they were effected by the initiative of the enterprise or motivation from outside. It has been borne out by our survey that external motivations were almost merely those linked to the development of settlements. The enterprise decisions were mostly called forth by situations of constraint – obsolescence, physical destruction or danger of accidents caused by these – or some shortage of productive factors acted coercively. It is rarely experienced that the enterprises attempt to increase their economic results (profitability) in this way, since they have been able to attain it by even less „painful” ways, e.g. by raising their prices or acquiring state subsidies. According to the basic principles of the changes in the economic regulators to come into force on January 1, 1985, this situation should radically be changed. In line with these endeavours of economic control, liquidation of some enterprises – eliciting great press reaction – and cuts within enterprises (divestments) were also carried out in Hungarian industry.

3. Some Conditions of Reduction

The processes of reduction could be strengthened as the common result of several jointly working conditions which would call for flexible changes in the economic structure of the country. The fundamental condition is to create *interest* of the enterprises in economic reduction, in other words to employ economic regulators which place increasing efficiency into the focus instead of the so far emphasized basic interest, i.e., the coercion to grow. As the new economic regulation to be introduced on January 1, 1985 – which will be asserted by more strict income regulation – is expected to mean a coercion to make reductions, it seems to be reasonable to extend future research in a greater measure to the investigation of the *effects* of economic regulation. It is first of all expectable that (according to previous calculations) the sphere of the enterprises struggling with financial difficulties will increase. It is also expected that the situation of some of these will not turn to the better either by internal reorganization, by changing the line of products or by state support and so – since the reserves which can be mobilized will also become more and more exhausted – their partial or total closing will become necessary. The reductions will very likely be also prompted by the intention of central control to drive the insolvent enterprises to an automatic path, less dependent on state administration.

Among the numerous limits to reductions the convertibility of the fixed assets also plays a delimiting part as the result of which the reductions may bring about losses to various extent.

Here we should like to stress two of the conditions of reductions which are currently impediments of setbacks within the enterprise and consequently may be the same on enterprise level, too. These are the turnover in selling the industrial buildings and the used machines and the re-utilization of the work force.

a) *The Turnover in Selling the Industrial Buildings and Second-Hand Equipment*

While statistics annually report the entry of about 300–400 new industrial buildings into the Hungarian economy, the losses (destruction, sorting out) are not registered. Our survey showed a similar situation, closing the plants had only rarely been followed by scrapping and we hardly found any initiative measures for the re-utilization of the buildings out of use. The demand for such measures was first of all raised by the executives responsible for the management of territory in Budapest who attributed the *disorderly state* of these intensively industrialized areas, among other things, to the falling of such activities into the background. The leaders of industry argue by saying that the old buildings out of use charge their cost accounts only to a minimum, while capacity or financial resources to pull them down or maintain their condition are not available. Within the decisions made on investments the costs of liquidation or demolishing are not at all reckoned with.

The argument is only partially acceptable according to which, owing to their bad state of repair and limited possibilities of utilization, these landed properties render no economic advantage to the enterprises wishing to expand. A few good examples were found in the course of our survey. We have met cases when the place of industrial activity was taken over by commercial enterprises willing to extend their areas for the purpose of marketing and storing.

In our opinion an *assessment* of unused industrial properties and the infrastructural projects linked to them would enliven the turnover of these fixed assets. Of course, it would be necessary to support starting of this flow of assets by adequate registration and an expedient institution ought to be found for doing this work.

The fate of the equipment becoming redundant is to the major part similar to that of the buildings. Our research shows that the machines that become unnecessary in the closed plant are relocated to other plants of the enterprise. Not more than 25 per cent of these machines were sold and the share of those scrapped was negligible. This is conspicuous even because among the reasons that led to closing the plant obsolete equipment was playing a significant part. This kind of passive behaviour of the enterprises can be explained – in addition to low cost sensitivity – by inadequate functioning of the channels for selling second hand equipment.

The enterprises trading in the means of production which ought to fulfil this task operate insufficiently. Their interests are negatively influenced by the limited possibilities of storage, the shortage of financial sources to cover the costs of stockpiling

and the financial interests of senior management stimulated to reduce the volume of stocks annually.⁶

The enterprises under the supervision of trusts (holding companies) feel the increasing activities of the firms engaged in selling the unuseful machinery even less important. But as a result of the loosening framework of the trusts and continuing growth of enterprise autonomy it may be expected that this sphere of the enterprises will also require increasingly the activities of intermediate trade.

b) *Re-Utilization of Released Manpower*

The reduction of the plants – according to the experience of our research – caused no serious problems of manpower. This is, first of all, due to the fact that the majority of plants employing only little staff were affected and redirection of labour could be carried out within the enterprise. The cases when larger numbers were involved occurred in Budapest where – according to the informations given by the enterprises – finding employment for the workers caused no trouble. On the contrary, upon the rumour of closing the plant *fluctuation increased*. In several cases, however, it turned out that the redundant workforce remained engaged by the enterprise further on. This was characteristic in the cases of reductions which were initiated by the controlling organs or the local councils and the opportunity to "conceal" the manpower was considered an *allowance* to the company.

Owing to the undeveloped practice in reduction, certain forms of employing the released labour efficiently or ways of drawing them out of work which are practically widespread in the advanced capitalist countries are less familiar to Hungarian industry. For instance we did not find cases of early pensioning or part-time work. Thus, hiding the workforce must be considered a provisional solution until the formation of more advanced methods of labour management and, since it is a more favourable alternative than to continue operation of the low-efficiency enterprise units, it would not be correct to condemn in unequivocally.

The government supports the activity of the enterprises to train adults for new trades by the ways of financial subsidies advising and organizing training courses. The emerging demands indicate that re-education within the enterprise is more preferred than the subsidies for retraining and preparing people for regrouping them between the enterprises. Only a few claims laid for the latter, linked to centrally initiated enterprise reorganizations.⁷ This fact underlines that the enterprises strive to substitute their jobs becoming redundant even by changing the range of products and to keep their workforce in that way.

We hope that in the future regrouping the labour force between enterprises will take place in increasing numbers. Partial or total liquidation of the enterprises unable

⁶These problems are summarized in the study of J. Bodrogi: *Miért nincs, ha van* (Why are Existing Things Non-Existent?). *Figyelő*, March 29, 1984.

⁷See A. Soós: *Új lehetőségek* (New Opportunities). *Figyelő*, August 23, 1984.

to change their situation forecasts a rapidly increasing demand for re-education that also enforces the widening of retraining opportunities, first of all in those fields of industry where ample changes of organization are to take place and the choice of available jobs is narrow.

As shown by our survey it is often the lack of experience of the *leading* and directing staff that has led to the closing down of industrial plants. We have met such problems both in the cases of factories handed over to large-scale agricultural units (farms) and in those of enterprises wanting to replace the lost production of the closed old plants in new ones situated in other regions of the country where there were no traditions of the production concerned. This calls attention to the fact that changing the production structure or technological modernization without providing leaders with the necessary skill and experience does not result in higher efficiency and that such experiences do not encourage the changes otherwise absolutely necessary.

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We think that the problems linked to the closing of industrial plants may be interesting not only for the enterprises being in critical financial position but for all those who wish to increase the profitability of the enterprise by closing the inadequately efficient, outdated plants impairing regional development or not fitting into the line of their production. This is why it is hoped that a *changing of views* will take place in the sphere of central and enterprise management which will consider "closing" not the final stage of a disease but a natural phenomenon of dynamic development.

Improving the conditions for other forms of plant closing and reduction might definitely contribute to such changes of views.

AUTONOMY OF MEDIUM-TERM ENTERPRISE PLANNING AND ITS RELATIONS TO NATIONAL ECONOMIC PLANNING

GÁBOR PAPANÉK

In 1981–1983 the Research Institute of Industrial Economics of the Hungarian Academy of Sciences surveyed the situation of medium-term (five-year) enterprise planning and the possibilities of its further development in collaboration with the Institute of Economic Planning of the National Planning Office. The aim of this paper is to present some of the most important results of the research and to give a picture about the relationships between central economic control and the planning of the independent enterprises as it developed in Hungarian industry.

The Subject Matter and the Methods of our Survey

As it is known, the possibility of autonomous management was granted to the Hungarian industrial enterprises by modifying the system of economic control and management in 1968.

The 1968 modifications were aimed at changing the practice of central economic control that had been developed since 1946–1947. In that system which was traditional in the centrally planned countries the enterprise plans were defined by "breaking down" the national economic plans. Thus, in the course of planning the central organs decided on the activities of the enterprises, what is more, "of the plants, workshops, every single working bench and worker" forecast for the plan period,¹ on the resources to be utilized, production, deliveries of goods among the producers, the prices to be applied in accounting, the directions of developing the enterprises, and so on. The system of incentives (wages, salaries and premiums) mobilized the workers and their collectives to fulfil the plans. This strong centralization made it then possible to concentrate the available resources to the development, i.e., rapid industrialization of the Hungarian economy. However, unforeseen disturbances in the operation of the system, impeding the fulfilment of the set targets, occurred frequently; these were first of all shortages and, ever more often troubles caused by the low efficiency of production. At the outset economic and political leadership attributed these problems to insufficient experience and practice of the planners or, respectively, to the effects of power working against the social system and thought

¹ Breakdown of the plans in the given details was ordained by the laws of 1949 and 1951 on the five-year plan for the period 1950–1954.

that these "infantile disorders" can soon be overcome.² Pragmatic analyses starting later, however, marked the over-centralization of the economy and the consequent limits of interest and flexibility as the main reasons of the emerging problems.³ Therefore the resolutions which prepared the 1968 modification of the economic system set the target to decentralize the spheres of authority powerfully, to make decisions in the field of management, i.e., implementing the national economic plans, — while, at the same time, maintaining the advantages of central planning by determining the main trends of development of the national economy.⁴

The provisions of law promulgated in 1968 and the following years introduced a series of many-sided measures.⁵ Numerical breakdown of the national economic plan to enterprises had ceased and the majority of decisions concerning production were delegated to the competence of the enterprises. In the hope of diminishing earlier shortages the coordination of product deliveries in the majority of cases became subject to delivery contracts between the enterprises selling and buying (allowing also the use of free prices to a greater extent). In order to improve the efficiency of management, the working communities were motivated to increase the profitability of production. And for the purpose of realizing the central targets set in the current national economic plan, a great arsenal of tools for the *indirect* control, regulation and motivation of the economy (an appropriate system of taxes, subsidies, credits, etc.) has been developed.

Our aim in the framework of our common research was to survey the role of enterprise planning amidst the new circumstances. We started from the fact that from 1968 on, owing to the modification of the economic control system, central planning rarely marked out tasks to be realized by enterprises or enterprise groups. At the same time the enterprises, either by themselves or on central initiation, prepared the plans more and more frequently outlining their future position and activities. In the course of developing the new practice close ties have been created between enterprise and national economic planning: the planners of both above-mentioned planning spheres were enabled to get acquainted with the forecasts, plans and decisions mutually. It became furthermore clear that — by resorting to the arsenal of tools available to them — the central organs of economic control can strongly encourage the enterprises to develop plans and economic management appropriate for attaining the central targets. But we also gathered more information on the problems of the new system. Some examples of enterprises became known where the planners were, even recently, not looking for the possibilities of improving efficiency. In other cases it could be seen that though the forecasts drawn up in the planning documents were adjusted to

²See e.g. the speech of Zoltán Vas addressed to Parliament recommending the modification of the laws on the first five-year plan. Published in: *Ötéves tervünk: béketerv* (Our Five-Year Plan: a Plan of Peace). Szikra, Budapest 1951. Quotation from page 9.

³Kornai J.: *Overcentralization in Economic Administration*. Oxford University Press, London 1959.

⁴Resolution of the HSWP CC on the Reform of the Economic Mechanism. May 27, 1966.

⁵In more detail in English see e.g. Friss, I. (ed.): *Reform of the Economic Mechanism in Hungary*. Akadémiai Kiadó, Budapest 1969.

the directives of the central plans, the efforts in practical enterprise management were aimed at implementing other targets. As questions discussed in economic literature and in practical life, we wished to study

(1) how far the enterprise plan does or can orient or regulate autonomous *enterprise management* under the described circumstances (especially, to what degree the 3, or 5-year plan does or can formulate the strategy of the enterprise) and

(2) what role the enterprise plans do or could play in the implementation of the *national economic plans*.

In order to find answers to these questions,⁶ we surveyed 50 enterprises. Our "sample" consisted of 11 enterprises producing basic materials and energy, 18 engineering, 9 chemical and 12 foods processing and light industrial enterprises. From among them 12 were smaller firms (employing less than 1500 persons), 17 large ones (employing more than 5000 persons), and 21 medium-size. As it can be seen from this list, our sample is not representative in every respect, the share of large enterprises is greater than on the average in Hungarian industry. In the course of the research project, from the enterprises – i.e. the planning experts working with them – data in written form, based on uniform and detailed questionnaires, brief textual analyses, opinions were twice collected and information was also gathered on the spot. Before finally formulating them, the findings and conclusions of the research were submitted to national scientific forums for discussion. Following this, our most important recommendations were forwarded to the economic control organs dealing with the development of national economic planning, who then built them into the decrees being prepared for the purpose of updating the economic control system.

Enterprise Plans in the Orientation of Enterprise Activities

The present system of planning is regulated by Act VII of 1972. According to its provisions, the state defines the main targets, the extent and the proportions of economic development, the main socio-economic aims and the tools of implementation, in the framework of the national economic plan. Parallel to this, every economic unit (state enterprise or cooperative) and council (local control organization) is also obliged to elaborate 3 to 5-year plans.⁷

The *main task* of enterprise planning, also prescribed by the Act on planning, is – in accordance with recent standpoints of authors in the special literature and of the leaders of Hungarian economic control – orientation and regulation of economic management, the preparation and making of the principal decisions as well as marking

⁶On behalf of the Research Institute of Industrial Economics of the Hungarian Academy of Sciences Katalin Demeter, Éva Nádor, Péter Sárkány and the author, on behalf of the Institute of Planned Economy of the National Planning Office Péter Ákos Bod, Katalin Faragó and Mrs. József Huszár took part in the research. A volume giving a detailed picture of the research is going to appear in Hungarian. Papanek, G. (ed.): *A középtávú tervezés iparvállalatainknál* (Medium-Term Planning in the Industrial Enterprises of Hungary). Akadémiai Kiadó, Budapest.

⁷Act VII of 1972 on National Economic Planning. *Magyar Közlöny*, 1972. No. 104.

out the ways of implementing them. For instance, the following quotation from the instructions on planning of the President of the National Planning Office is rather characteristic: "The medium-term economic plan defines the main directions and targets of enterprise economic activities and the tools necessary for their implementation".⁸

According to our experience, the tasks of economic planning described in the quotation are implemented in the effective current practice of the Hungarian enterprises only partly.

We received information on the *fulfilment* of the above tasks. The same standpoint could also be supported by the analysis of the capacities created for carrying out the tasks of planning. Namely, already in the 1950's, in the course of developing the planning system, relatively significant enterprise planning sections had been set up in Hungarian economy and industry. Though after 1968, in line with the modification of the tasks, the size of these departments has been decreased, according to informations gained in our research, most planning organizations within the enterprises consist of 5-9 persons even today. The importance of planning is shown by the fact that, contrary to the earlier unfavourable situation, today about half of the staff possesses university degrees. In addition, with a number of enterprises, the creative contribution of the working community is also requested and utilized in the preparation of the plans. The participation of senior management of the enterprise in planning is also widespread (and, parallel to the increasing autonomy since 1968, growing) almost everywhere.

Furthermore, it has been borne out by our survey that enterprise planning, with participation of the described staff, made really strenuous efforts to fulfil its task. In the case of the most enterprises e.g. the experts involved in the survey found that the technical staff provides a more or less wide choice of alternatives for medium-term planning, while the planning department performs the computations for detecting the details and correlations, and senior management makes the decisions in questions where it is needed. All this is shown in *Table 1*.

On several occasions during our survey we became convinced about the important role of the approved plans in guiding economic management. Our information are characterized in detail by *Table 2*. It is likely, though, that the ratio shown by the Table of the enterprises (experts) who attribute an orienting but numerically non-obligatory character to the medium-term plan targets is somewhat higher than in reality, since those questioned were aware of the fact that this view is conform with the official opinion. Still, the table undoubtedly shows that the majority of the enterprises utilize – the "smaller" ones even more than the "large" ones – the orientation of their own plans in economic management.

The real importance of the enterprise plans is indicated, however, by the fact that the surveyed enterprises strive to harmonize their plans to a great extent with supplying enterprises. According to the following data these endeavours are especially strong in the short run.

⁸Guidelines Issued to the Decree of the Chairman of the National Planning Office. *Tervgazdasági Értesítő*, 1980. 1. Quoted from pp. 26 and 39.

Table 1

The participants in medium-term planning and their tasks

Participants	Ratio of enterprises giving tasks to the participants in planning, in percent			
	in drawing up alternatives of development	in working out the plans	in making decisions	less than would be justified
Technical staff engaged in production	32	48	18	18
Technical staff engaged in development	70	60	34	—
Economic and financial experts	32	70	50	6
Commercial experts	30	50	36	10
Senior managers of the enterprise	40	20	82	2
Social bodies	10	26	38	20
Planning apparatus	34	80	30	6

Table 2

The role of the medium-term plan targets

Roles	Ratio of the		
	small	medium-size	large
	enterprises asserting the described role in percent ^a		
Obligatory indicators	25	19	18
Minimum forecasts	17	24	6
Indicators of main lines of enterprise management, non-obligatory figures	75	67	71
Data for general orientation	8	38	24
Others	—	—	6

^a) Some of the enterprises assert more than one role, therefore the ratios of most indicators add up to more than 100.

Reconciliation of material purchase plans with the potential suppliers

Reconciled ratio of the demand (in percent) ^a	Ratio of enterprises which reconciled the given share of planned material purchase in 1981 for the year		
	1981	1983	1985
	in percent		
0	—	12	18
1–20	—	16	16
21–40	—	8	10
41–60	2	8	8
61–80	12	18	18
81–100	86	38	30

a) as compared to the total demand

A few further findings indicate also clearly – on the other hand – the still existing *limits* of the role of enterprise planning.

We have e.g. analysed and not rarely found the perspectives and the sphere of motions of the possible plan alternatives of the enterprises restricted. We also wished to investigate in our work, how far some "external" circumstances, the given endowments of the companies, or even enterprise decisions made sometimes necessarily, other times unjustifiedly, prior to planning, exercise decisive effect on the enterprise plans. Of course, we could not reveal every restricting factor. Hence, we took into account that the enterprises, for the most part, considered the market problems and the difficulties linked to acquire the resources of production (with emphasis on investment funds) as the most significant problems of the plan period, therefore concentrated on these subjects. By doing so we have established that several details of the enterprise plans are really predetermined but the planners can reckon with not insignificant scope of movement even in the fields of some details. For example, the volume of production covered by contracts in the period of planning – according to *Table 4* in the following – shows rather wide market possibilities in the case of most enterprises (at least in the short run), and means much more a predetermination deriving from capacities engaged than difficulties arising in loading free capacities.

Table 4

**Distribution of the enterprises supplying information
by the volumes of orders on hand at the time of planning (in percent)**

Share of capacity engaged by orders	for 1981	for 1983	for 1985
0– 30	10	44	47
31– 60	8	24	29
61–100	82	32	24
Total	100	100	100
Number of enterprises that gave no answer	–	9	12

Similar degrees of limits are proven by the following data characterizing the scope of movement in the investments (though they seem to be different by branches).

Table 5

**Distribution of the enterprises supplying information on the basis
of the ratio of the 1981–1985 investment funds predetermined by contracts
or other obligations (in percent)**

Predetermined ratio in percent	Industrial branches				
	Production of raw materials and energy	Engineering	Chemical industry	Light and food industry	Other
0	18	28	–	67	30
1– 30	36	22	44	25	30
31– 60	10	11	–	8	8
61–100	36	39	56	–	32
Total	100	100	100	100	100

According to our experience, however, certain further factors in Hungarian industry restrict the role of enterprise planning sometimes more powerfully than the former ones. It seems, namely, that the enterprises are often not – or not in the theoretically recommended way – striving to make use of the possibilities rendered to enterprise management by planning. We received informations on enterprise management by planning. We received informations on enterprise decisions which were not fitted into the process of planning, or efforts and endeavours which were not foreseen in the plans. The experts demonstrated this practice of so-called double

planning in 28 percent of the enterprises: in these cases enterprise management, after having compiled the plan documents, was striving more or less openly to attain targets they thought inexpedient to settle in the plan. Furthermore, we found in a great number of enterprises the signs of a certain disinterest in the directives of the documented plan: though the approved medium-term plans became obsolete relatively rapidly, efforts to update them were rather rare. The plans elaborated in the spring of 1981 were considered obsolete (in details) already in the autumn of the same year by 72 percent of the enterprises. In the spring of 1983 the real information content of the plans decreased further and in spite of the occasional plan corrections by that time no medium-term plan, considered valid at least in its main lines, was available at all with one quarter of the enterprises. It is obvious that in the case of such rapid obsolescence the plans covering several years can only play a restricted role in the orientation and regulation of enterprise management.

In our research we tried to reveal those active factors in detail which prompt the enterprises to narrow the role attributed to autonomous planning. A picture about the findings of this investigation can be given by the following analysis.

Relations between National and Enterprise Planning

As we have mentioned, economists are of differing opinions on the desirable relation between national and enterprise planning and especially about how the enterprises help or can help the fulfilment of the national economic plans. Several publications and official statements after 1968 have emphasized that the national economic plan formulates tasks of the government and that the governmental organs have to promote their implementation not by direct planning instructions but by the indirect tools of economic control. In this way economic planning may become a tool of enterprise management. Others, however, as well as the official provisions developing the new system of economic control have attributed a *double role* to enterprise plans. As mentioned earlier, abolishing the practice of breaking down the central plans to enterprises, they emphasized the importance of *autonomous enterprise planning*, but destined important roles to enterprise planning in *supplying basic information to national economic planning* as well as in aiding the fulfilment of the central plans.

The provisions serving for the assertion of the above described principles prescribe (a) that the National Planning Office must inform every enterprise about the main statements and decisions of the national economic plan, (b) that some of the larger enterprises have to be involved in central planning, (c) that the enterprises should also inform the central organs about their plans. Act VII of 1972 ordered further that (d) "The economic organizations (enterprises, cooperatives) are obliged to set up their plans so as to secure the implementation of the decisions of the national economic plans affecting their activities and the requirements expressed by the means of regulation."⁹

⁹Op. cit. in Note 7, quotation from p. 1129

In the practice of planning because of the presented provisions a really many-sided relationship (exchange of information) has developed between the plans and the planning organs of the national economy and the enterprises. These – direct – relations were able to complement in a specific manner the indirect possibilities of economic management to influence enterprise planning and activities. Thus, on the one hand, the *informations given to enterprises* about the national economic plans, on the other side the collection of information about the enterprise plans became traditional. The contents and appreciation by the enterprises of the former can be characterized by the following data:

Table 6

**Central informations (or, decisions) deemed necessary
by the enterprises**

Information or decision	Ratio of enterprises		
	requiring and receiving	requiring but (partly) not receiving	not requiring
the information in question, in percent			
Quotas of the CMEA	24	16	60
Decisions on central investment projects	20	14	64
Decisions on central development programs	20	14	66
Decisions on regional development	8	24	68
Changes of organization	8	20	72
Modifications of profit distribution rules	30	38	32
Modifications in wage regulation	30	42	28
Decisions on subsidies	12	40	48
Decisions on credits	14	32	54

Among the larger enterprises in addition to the central supply of information also the *direct participation in central planning* turned out to be important. In the scope of our survey the forms and frequency of this developed as follows:

The forms and frequency of participation in central planning

The form of participation	Ratio of the		
	"smaller"	"medium-size"	"large"
	enterprises participating in the given way, in percent		
Direct assistance in national economic planning	8	10	65
Assistance in working out sectoral development concepts	17	43	82
Participation in working committees of the CMEA	25	33	71
Assistance in elaborating technological forecasts	—	43	65
Other forms	8	10	24

It is interesting that regarding the usefulness of the contacts presented in *Table 7* the central control organs and the enterprises are not of the same views. For instance, according to central planners the aim of the enterprises directly participating in central planning was not to render realistic information but to influence the "higher" decisions in their favour therefore very often there was no possibility to make significant use of this source of data in central planning. On the contrary, the experts of the enterprises, to a major part, deemed the possibility to be involved in central planning as rather favourable.

Our survey revealed that a wide sphere of enterprises deemed the central information obtained from the above and other sources as indispensable for drawing up their plans. According to the following table, priority in this respect was attributed to the central forecasts of opportunities of investments and wage payments (namely, in these issues the regulatory system punishes the enterprise management if it deviates from the central ideas).

The research also revealed positive and negative experience regarding the methods used so far to *get acquainted with enterprise targets and efforts*. Namely, in the past (medium-term) planning period the central organs asked every economic unit to submit its plans and in addition obliged them to supply a large number of data and information, sending out detailed questionnaires. An overall picture of how the enterprises evaluated this practice is given in *Table 9*.

In this case conclusions from the data of the table can only be drawn in knowledge of the arguments found in the expert opinions. Several of our experts, giving a positive evaluation, emphasized that it was very useful for them to be able to prove the assertion of the targets and expectations set by the central organs. The described methods

Table 8

Enterprise judgements on the importance of basic planning informations*

Information supplied by	Distribution of the value points characterizing the importance of information obtained from the given organizations on the subject matters						
	a	b	c	d	e	f**	Total
other enterprise	51	29	11	11	54	50	39
central agency	39	61	69	68	36	40	49
other organs	10	10	20	21	10	10	12
Total	100	100	100	100	100	100	100

*The enterprises estimated the importance of informations gained on each subject matter to 2, 1, or 0 value points.

- **a) informations on purchasing possibilities
 b) informations on development (investment) projects
 c) informations on labour
 d) informations on wages and salaries
 e) informations on selling possibilities
 f) informations on selling prices

Table 9

The methods used by central agencies for becoming acquainted with enterprise plans and their valuation

Method	Ratio of enterprises which valueate the method		
	positively	neutrally (or not at all) in percent	negatively
Asking to submit the plans	18	52	30
Asking to submit "plan information"*	20	34	48

*An enterprise gave partly positive, partly negative valuations, so the index numbers add up to more than 100.

of collecting information enabled them to broaden their otherwise narrow "higher" contacts to influence favourably the "image" developed about their enterprise by the

central control organs, to improve – as a result of higher approval of the plans – the possibility of realizing them (e.g. obtaining the central grants, allowances and favours forecast in the plans). Some experts also deemed it useful that the "attention" of central organs (as a substitution for the power of the incentive system which proved weak for this purpose) prompted the management of their enterprise to a higher quality of planning work. The reasons explaining the negative estimations are similarly characteristic. Most experts, criticizing the submission of the plans, said: the plan forecasts desirable from the view of their enterprise differed from either the tasks deriving from the national economic plans, or more often, from the higher "expectations". However, since the plans had to be submitted to the control organs, enterprise management came to face a contradiction (conflict of interests) as the result of the double role of planning, which it could solve only by a "compromise". This means that, in order to acquire the benevolence of the supervisory authorities, they formally "asserted the requirements raised by the national economic plan", "had put into the plans or approached the expectations", "took into account, or fulfilled the claims of the controlling authorities" in their plans. At the same time they were also aiming to assert the particular interests of their enterprise, therefore in practical management work they followed targets and efforts other than those fixed in the plans submitted to the central organs. Nevertheless, the plan informations collected in the form of tables were violently criticized, if only because being all too detailed (although the criticism was less sharp than in earlier planning periods).

Many experts, not influenced by enterprise interests, similarly think that the direct information contacts between national and enterprise planning can supplement the scope of movement of the indirect tools of economic control to a certain extent and will or can contribute finally to the fulfilment of the targets by the national economy.

In order to adduce arguments to the answer given to our question, the National Planning Office compared the main indicators of the medium-term national economic plan every time with the index numbers obtained by summarizing the enterprise plans and did so after working out the five-year plan of the period 1981–1985, too. This survey – since, after having completed the enterprise plans, the above mentioned types of "compromises" left no trace, – established mostly that the differences between the plan figures of the national economic plan and the summary of enterprise plans are small. Namely, while the totals of the production and especially of the export plans of the enterprises were somewhat under the central forecasts, in respect of labour, investments, inputs of imports, the enterprise forecasts were a little higher than the central ones. The differences, however, remained mostly within the margins of error in planning, and formally reflected strong efforts of the enterprises for the implementation of the national economic plan.¹⁰

But the National Planning Office's investigations – and our survey as well – analysing the enterprises' efforts to fulfil the non-numerical central targets led to less favourable results. Several times significant differences seemed to emerge between the

¹⁰Hoós, J.: A vállalatok és megyei tanácsok VI. ötéves tervezőmunkájának tapasztalatairól (On the Experience with the Planning Work of Enterprises and County Councils for the 6th Five-Year Plan). *Pénzügyi Szemle*, 1981. 5.

plan targets of the national economy and the aims defined by the enterprises in their plans. In the 1970s and 1980s it became ever more clear on the level of the national economy that an essential improvement of efficiency in economic operations is indispensable. Several signs indicate, however, that the enterprise plans do not reflect this recognition and its consequences and do not seek the possibilities of increasing efficiency which can be exploited first of all in the enterprises with necessary intensity. We have often discovered the lack of informations needed to analyse efficiency for determining the tasks to raise it. Though detailed calculations of profitability were frequently found in the plans, it is in vain to try to find the conclusions drawn from these in the enterprises' targets. What is more, decisions contrary to considerations of efficiency could often be demonstrated, e.g. the extension of activities deemed from the outset to cause losses were often included in the plans. Thus, it could be seen that we failed in eliminating the well-known problem of the previous system of economic control that, while the economic units strive to include the quantitative forecasts of the center in their plans, insufficient attention is directed to realize the targets of quality. It was also clear that these phenomena can, to a great extent, be explained by the aforementioned disturbances in the role of enterprise planning, among other things by the formal efforts to reflect the "higher" expectations in the plans.

Further analysis of the planning problems pointed to other causes distant from the very subject of the present paper, linked to several elements of the regulation system. We have often found that the problems of interests were decisive reasons of the difficulties. It is generally known that our system of economic control puts the emphasis on the operative tasks of the enterprises and does seldom force senior management to actions based on the consideration of tasks of the long run, or encourages them only very slightly to do so. In our experience this by itself reduces the interest of the enterprises in creating higher quality autonomous plans. It shows that to broaden the role of planning and to improve the relation between national economic and enterprise planning requires also measures outside the planning system, linked to the modernization of economic control as a whole.

Conclusions

On the basis of the informations outlined above, gained by our research, we drew the conclusion that since 1968 a double role of planning has taken shape. Increasingly important tasks are attributed to the plans in orienting autonomous enterprise management but an important function of them is to help national economic planning to support the fulfilment of the centrally set targets, too. This double role makes it possible to plan more effectively than earlier — but several opportunities of improvement are still hidden.

Our surveys made it also possible to outline the tasks needed to improve enterprise planning and the contacts between national and enterprise planning. In working out our recommendations we started from the concept that, regarding the main targets and interests of economic policy, information will be given to the enterprises even in

the future mainly by using indirect methods, through economic penalties and incentives. Hence, we need not insist on the appearance of the central will in the way of formal interdependence of the plans. We deem it the most essential element of improving the investigated system of relations that the enterprises receive the central planning informations in the future — more ample than so far — in a way harmonized with the mechanisms of indirect economic control, that is, really without any claim of being formally reflected in its plans and without the possibility of detailed control.

We think it necessary to consider whether the paragraph of the 1972 Act on planning we quoted at the beginning of the preceding section regarding the harmony of central and enterprise planning should be interpreted in a manner more strict than up to now, in order to meet the above mentioned requirement. It is obvious that in creating this harmony not only the enterprises have or may have essential tasks but the central organs are also expected to take numerous measures (in the development of expedient regulation system, or perhaps by employing the system of the so-called plan contracts or state orders, etc.). Furthermore, it is possible that in the case of differences between preliminary forecasts of the national and enterprise plans (or between the endeavours of the sectoral control agencies and the enterprises) we so far prompted the *enterprises* to modify their forecasts too soon and to a too wide extent. After having discovered the differences a repeated checking of the central plan should not be omitted.

For the sake of improving the investigated system of contacts it would be purposeful to permit the enterprises to supply planning informations to the central organs independently of their own plans on their efforts that may be important from macro-economic views. Furthermore, it would be wise to end the practice of compulsory submitting of enterprise plans. In this way the plan could not become a misused tool of the enterprises for influencing the central organs.

Beyond all that our experience also indicated that the described system of planning relations in itself is by far not sufficient for the desirable changes of the Hungarian system of economic control. Though the implementation of our propositions would mean a help in achieving many of the aims set by the national economy, it can only supplement but not replace either the enterprises' efforts in planning or the creation of an economic mechanism that can stimulate the enterprises to long-term management and planning.

SOME TECHNICAL AND ECONOMIC EXPERIENCES OF ENGINEERING ENTERPRISES IN SHAPING THEIR PRODUCT STRUCTURE

GYÖRGY PARÁNYI

Development of the product structure is a generic term, including the modernization of existing products of the enterprise, thereby enhancing their marketability; developing new products, partly in the traditional product line and partly belonging to a new line of products; and finally, eliminating obsolete products.

The direction and internal proportions of developing the product pattern are determined by the demand and the opportunities of the market as well as by the objective to increase economic efficiency. From the technical side, development is aimed at the desirable modernization of the products as well as of production technology.

Technological development has always been an important task of the Hungarian industrial enterprises. To speed up its rate, to improve marketability of the products, mainly to adjust them to the export requirements has been in the focus of Hungarian economic policy since the early 1970s, and gained special emphasis in the mid-years of the decade, i.e., since the world economic depression set in.

The review on how the general guidelines formulated in government resolutions were practically realized in one of the most important branches of industry, in engineering industry, was the subject of a survey carried out by the Research Institute of Industrial Economics of the Hungarian Academy of Sciences.

The large enterprises were selected for the purpose of the analysis which practically represented all the significant subsectors of the engineering industry. Their production in 1980 accounted for 13 percent of the total value produced by engineering. Using actual data and expert opinions on these 10 enterprises we reviewed (1) the entire product pattern; (2) the characteristics of 84 products considered the most important by the enterprises representing 74 percent of their total production; (3) the particularities of the development of 31 products selected from the latter ones (in production value half the group) apt to be generalized. The survey was centred on the period of the fifth five-year plan, between 1976–1980.

In the following we are going to present a categorization of product development, then the enterprises' *objectives* and the *effects* achieved in the same categorization. Finally the *factors influencing the method* of development will be analysed.

1. *The Techno-Economic Structure in the Modernization of the Products*

In order to obtain a detailed picture of the products of various modernity and perspective, we have developed a classification into which *all the products can be fitted, according to their novelty*. We have pursued the analyses according to this division which has proved useful in practice and will present our result accordingly.

The novelty groups of the products were the following:

Group 1: New types of products, foreign to the range of production of the enterprise. A diversifying extension of the product line, products taken up either independently, or for the delivery of complete systems, differing from the traditional range of production.

Group 2: Entirely new products fitting into the range of production of the enterprise. Constructions based on applying some new scientific principle or serving for the fulfilment of some new purposes of using the product.

Group 3: Products substantially modernized from the point of view of the user. Construction variants of existing manufactured products, modernized in their function, regardless of the changes or development of production technology they entail. (The modernization may be aimed at e.g. making up for the backwardness compared to the international market; enhancing the use value; increasing the number of functional variants, etc.)

Group 4: Products modernized substantially with respect to manufacturing. Manufacturing becomes easier and more economical by some substantial "internal" modernization of the construction (e.g. improving the quality of manufacturing or promoting interchangeability; increasing economy in the inputs of material, energy, worktime by transforming the construction; improving aesthetic appearance).

Group 5: Products developed by some kind of minor rationalization. The purpose of the modernization does not affect the construction substantially but it eliminates certain deficiencies; it may follow fashion by minor modifications; or simplify certain operations of production.

Group 6: Unchanged products; products manufactured without any modification throughout the period analysed – apart from rough deficiencies to be eliminated.

Group 7: Products ceased to be manufactured due either to obsolete construction, or to uneconomical production or perhaps because of narrowing the range of products, production is passed on to another producer.

1.1. *The Composition of the Product Range by Groups of Novelty*

This criterion gives a picture about the extent and content of technological development and modernization. The criterion is what happened to the product manufactured already in 1980, throughout the plan period. Has it appeared as a new product, was it manufactured in an unchanged form, or has it been modernized? We determined the number of important products by novelty groups, the proportion of the latter to the rest of the products, reviewing their life cycle preceding and following the plan period.

The product structure of 1980 is demonstrated by Column „d” of *Table 1*.

Table 1

Development of the product structure in the surveyed period

Groups of products by degree of novelty		Distribution of the volume of products manufactured in 1980 (in percent)		Forecast change of the production from 1980 to 1985. Index number by groups
		Composition of those produced at the beginning of the plan period (1976)	Composition at the end of the plan period (1980)	
a	b	c	d	e
1	New, foreign to the range of production	—	2.1	4.7
2	New, within the range of production	—	9.2	2.4
Total of new products		—	11.3	2.8
3	Substantially modernized, with respect to use	14.2	18.3	1.2
4	Substantially modernized, with respect to manufacture	20.3	17.8	1.4
Total of modernized products		34.5	36.1	1.3
5	Products developed by minor rationalization	30.5	27.0	1.1
6	Unchanged products	35.0	22.6	1.0
7	Products ceased to be manufactured	—	3.0*	—
Forecast growth of total production volume		100.0	100.0	1.3

*With products transferred to other enterprises: 4.3 percent

The data characterizing the dynamism of updating the products are the following:

- During the plan period (until its end) the new products introduced amounted to 11.3 percent of the production which means 1–4 products per enterprise. (See groups 1 and 2). The enterprises intended to almost treble the volume of new products in the period subsequent to the survey (Column "c").

- The *products substantially modernized* during the plan period (groups 3 and 4) accounted for one-third of the production. Half of them were significantly modernized mainly from the point of view of *production technology*, the other half also from that of *use value*. The production of the modernized products was intended to rise in accordance with the average growth of production (30 percent).

- Another quarter of the products (group 5) were developed by *minor rationalization*.

- The remaining not much smaller ratio (group 6) of the products were technically *not modified*. (The assumption of the enterprises was that the production of these can be maintained in an unchanged quantity even in the future.)

The production of 3 percent of the products was stopped during the plan period.

Consequently:

- a) a smaller part (47.4 percent) of the production in 1980 consisted of products introduced and substantially modernized during the plan period;

- b) taking into account the rationalization process, 74.7 percent of total production in 1980 was developed during the preceding 5 years (groups 1–5);

- c) 76 percent of the 1980 production was already produced before 1976 and 51 percent of it (i.e., two-thirds of the traditional products) without any significant changes;

- d) the 30 percent total increment, planned by the enterprises, consisted of the increased production of the products manufactured in their basic types already in earlier years, significantly modernized during the plan period.

1.2 Raising the Level of Technological Standards

The general technical and economic purposes of developing the product mix, and their relative weight are shown in graphic form in *Figure 1* both for the complete sample and by groups of novelty.

Among the aims of making new products and perfecting the existing ones the most important ones are to keep abreast with international progress, to improve quality and to produce exportable goods.

- International competitiveness and *up-to-dateness*, – as can be seen from line A of *Figure 1* – has a medium weight on the average of the total sample.

- *Improvement of quality* (line B) has a greater weight. Modernization by following the others (to be dealt with later on) is a moderate but realistic purpose. It is interesting that to follow the international trends was decided by the enterprises

mostly with respect to the products which were new in relation to their special line of products¹ and those *modernized functionally*.

— A factor qualified as significant is to manufacture *exportable* products (line C). It is a realistic aim to achieve this goal mainly by moving in well-known fields, by *functional* modernization of existing manufactured products and by introducing *new ones within the special range* of products of the enterprise. It is worth attention that the above-mentioned purposes are mainly felt in the groups updated in their function while with respect to new types their weight is less. Regarding the chances of success of the new products it is unfavourable that no outstanding role was given to *quality improvement*.

As far as the *realized* developments are concerned, the changes were primarily aimed at diminishing the technological backwardness *in the functions and quality* of the developed products.

Outward appearance, improvement of design was also considered an important factor. In their turn, the quality and accuracy of manufacture increased essentially the result of development in general. The effect exercised on *exportability* is only moderate.

According to a comparison of development purpose and results by product groups the enterprises could not fully achieve their set targets. *The parameters of the products which were modernized in their function did not reach the planned ones, while the new products approached the targets more closely.*

We also reviewed the technical aims and solutions of the sampled enterprises or the degree of implementation of the particular actions of development.

The *general conclusions* to be drawn from the comparison of the standards of the related products of domestic and international manufacture are as follows:

- no significant difference can be found in the construction parameters;
- the lag in new construction is 2–6 years;
- compromises have to be made occasionally with respect to design materials and component parts;
- the structures are heavier, and their aesthetic appearance, quality, durability, wear resistance often do not match international standards.

1.3. *Improvement of Economic Results*

From among the objectives of product development those of achieving higher prices, reducing the costs and increasing the profits stemming from the increased volume of production (lines D, E and F of *Figure 1*) serve for the improvement of economic results.

- Increasing the profits by the *growing volume of production* is the foremost

¹The group of products which are new with respect to the main product line of the enterprise cannot be qualified, due to the small number of cases analysed. For this reason we will abstain from drawing generalizable conclusions from this group though for the sake of completeness we shall mention them here as well as in the following.

objective of the enterprises. As borne out by line F, this is the only purpose which represents significant weight in all of the four groups of novelty. From the introduction of products which are new with respect to the special product range the enterprises expect an outstanding growth in the volume of profits. But the fact that the products which were new to such a degree had not yet been introduced in the market and their immaturity arouse doubts regarding the reality of this expectation.

– According to the enterprises the feasible way to increase profitability is to sell the *new and functionally modernized products at higher prices* (line D).

– To increase profits by reduction of the inputs (line E) is an aim thrust to the background.

Though it is logical that the costs can firstly be reduced in the case of the modernized products, it seems that when developing the new products this objective hardly plays any part. The enterprises attach very little importance to the effects of development on *material-intensity*.² According to personal opinion, the decline in *labour-intensity* is also insignificant.

The rank order of methods (F–D–E) aimed at improving the economic results – taking into account the international situation – *reflects a non-adequate adjustment*. Owing to the lack of demand, the primary aim to increase the volume of production is unreal. Because of the strong competition the prices are depressed, so that restriction on inputs would be the only possibility, depending on internal and therefore much more utilizable potentials.

In the totality of the enterprise the effects of the realized developments on profitability are deemed significant; it is, however, curious that – in contrast to the forecasts – profitability of the new products *within the range of manufacture* special to the enterprise is the lowest.

The hierarchy of objectives by groups of novelty of the products is considerably varied. This makes us remember that the development of the product structure must not be treated schematically; multifarious interactions assert themselves among the objectives (and the tools needed for implementing them) and the methods of development.

2. *The Factors Influencing the Selected Methods of Development*

In the following we are going to present the factors and the extent to which they influence the enterprise in selecting one or another way of modernizing the products that are mostly developed.

²In the period following the survey a broad action to reduce the weight and material consumption of the products was started in Hungary.

2.1. *Preparation of Decisions, Alternatives of Development in General*

As regards the 31 types of considerably developed important products more than one *alternative* emerged only in 50 percent of the surveyed cases but the possibilities were elaborated to the depth needed for decision-making only in 29 percent.

In the cases where alternatives of development emerged, two phenomena were conspicuous:

- The *highest ratio* of alternatives can be found among the products modernized *with respect to manufacturing*. The explanation is logical; in the current practice of financing the investment projects this is the type of investments where the chances of the enterprises are lower than in the case of other development methods, consequently this prompts them to serious work in preparing their credit requests.
- The ratio of alternatives is the *lowest*, not more than 33 percent with the new products, fitting into the traditional line of manufacture. In these cases the alternatives were elaborated to the depth needed for the decision, and possibilities on both a higher and a lower level than the selected one were analysed. This ratio is not satisfactory for these are the products which form the main line of future production.

The actions of development with no alternatives given were mostly supported by the argument that the selected method is the most up-to-date solution. This opinion, though seemingly winning, makes one think in several directions (a) the "existing most up-to-date" does not always cover a single technological solution, since development usually progresses in several parallel directions; (b) overall information about the world market is also often questionable; (c) as an argument of decision it enhances our doubts against a conception that stimulates the creation of most up-to-date products without a selective survey of the market; these doubts will prove to be justified later on.

It is similarly questionable – although sometimes it may be justified – that the path to be followed is unequivocal, or that the users' requirements determine the given solution. All these depend on the issue of being adequately informed and even an unequivocally optimal construction may have several substantially different technological alternatives, and so on.

In fact, seemingly often only one solution is reckoned with, i.e., the one which was "invented by someone", or the one fulfilling most easily the emerging requirement, or the one "found right by the boss".

As a matter of fact, to form a true picture of the *role of the supervisory bodies' recommendations or opinions of the enterprise's senior managers* in the decision-making is rather difficult, therefore we attempted to investigate this question from several aspects.

The weight of this factor in setting the *tasks* of technological development is shown by line H of *Figure 1*: it plays a moderate part, and comes to be dominant in taking new products into the program which are foreign to the range of manufacture. The managers' opinion in choosing the method of development plays a decisive role in all of the product groups.

However, this is only rarely the reason for omitting the alternatives. It is mostly decisive in the case of new products within the traditional range of products.

The lack of development alternatives seen in half of the cases and the ratio of detailed analyses hardly exceeding a quarter of them, as well as the significant role of the leaders' opinion are two sides of the same coin. They indicate the voluntaristic views still existing in practice and the insufficient role played by techno-economic considerations in making the decisions.

2.2. Consideration of the Market Factors in Development Work

The enterprises involved in the survey *deemed the role of the market factors very important* in selecting the method of development. The elements of these are shown in detail in *Figure 2*. The factors are demonstrated in the order of decreasing average significance.

It is unequivocally favourable that the *buyers' requirements linked to the use value of the products* (a), (b), as well as the *element of connection between the mass of production and the order of magnitude of the demand* (c) are deemed important by the enterprises. The *complete production period* (e), a significant element of flexible adjustment, plays a moderate role in the decisions on development.

The static way of looking at product development is indicated by the under-estimation of the optimum volume of production versus the stationary or uncertain character of the demand (g). Notwithstanding, this factor influences to a great degree, already in the phase of designing, the costs of the construction and the flexibility of production.

An important problem is indicated by a factor not mentioned so far – which in the course of consultations prompted the experts to self-criticizism – namely, the knowledge of foreign prescriptions (f) whose importance was underrated. This may involve two harmful consequences:

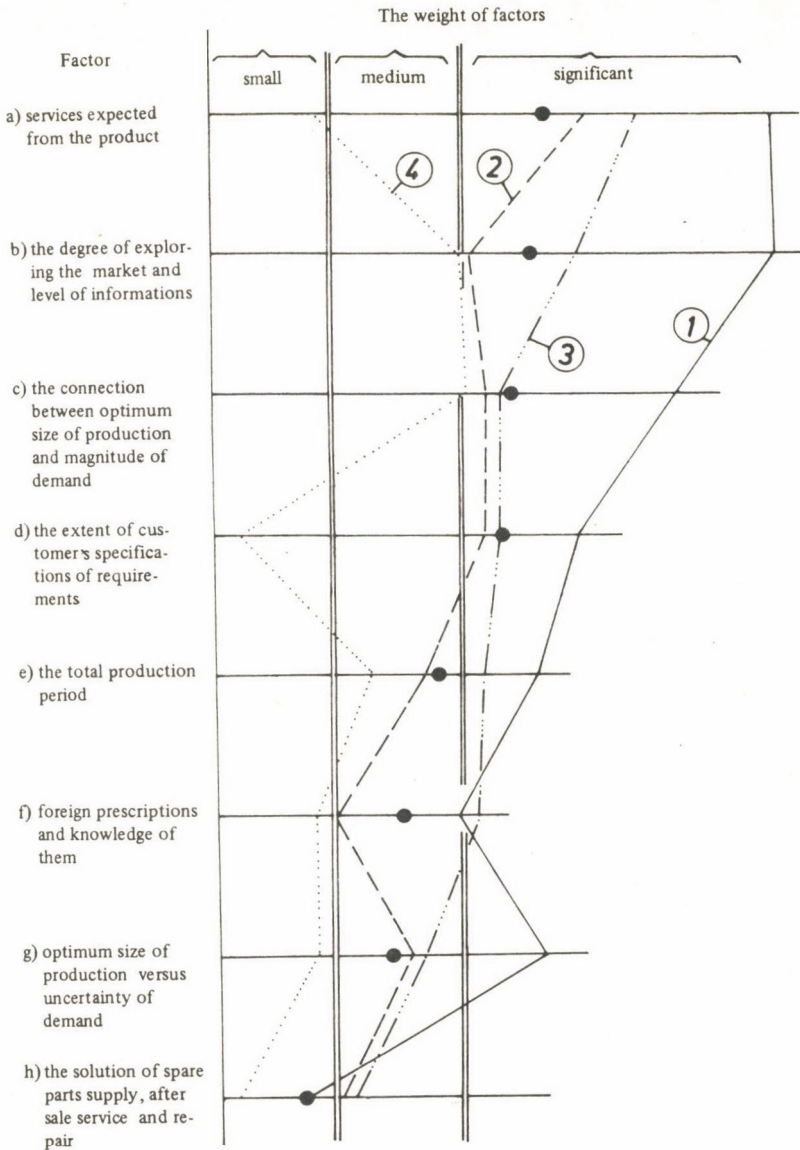
a) insufficient acquaintance with the specific standards, prescriptions on material, labour safety, health protection specified by the foreign customer may lead to *complaints*, and in less favourable cases to the cancellation of the order.

b) The concept of "products marketable in any market" might be valuable to call attention to the high standards needed for turning out products saleable in the most demanding markets and to improve quality but this "slogan" may also be the source of several uneconomical marketing actions.

The requirements of one and the same product may differ in several respect on the various markets. On the one hand products of different quality (and price!) may be considered the optimal ones according to the development level and the *standards of living* of the given country. On the other hand, national particularities, traditions, usage, specifications, standards also *influence* the demand.

Use value is only attributed to (and paid for) the quality which can be utilized. Requirements which may be minimal in advanced (and rich) countries regarding product quality and level of service may not be needed in less developed countries and in the latter the product may prove to be not serviceable. They might not even be able to handle the "over-modernized", sensitive equipment at all, and at the same time appropriate maintenance and repair cannot be provided either. Thus, a given product is

The role played by the factors linked to the market in selecting the way of development



Novelty group of product:

- 1 product new to the traditional product line
 - 2 new product within the traditional product line
 - 3 functionally modernized product
 - 4 product modernized with respect to manufacturing
- Average of products in novelty groups 1-4

not *simply of a better or worse quality*, it must be adjusted to the varying requirements (of different) markets.

It is remarkable that with the *products novel to the range of manufacture* and those *modernized functionally* (taken into development after a longer period) greater attention is paid to the foreign prescriptions. With respect to the new products *within the standard range of manufacture* this view is omitted, though it is the latter product group determining the production of the next period. *In this group development is seemingly controlled by tradition.*

Regarding the effects of realized development on market position, according to the enterprises the results are of a medium impact in the capitalist markets. In the socialist countries it is somewhat better and the situation shows a significant improvement in the domestic market.

As a conclusion it is conspicuous that on the one hand research and exploration of the market, the level of information, the knowledge of the services expected from the products are considered important, at the same time other factors (such as being familiar with foreign prescriptions and conditions, with actual demand, with continued services in order to ensure the position of the products on the market) are gaining insufficient consideration.

2.3. R+D and Technology

The extent of research and development (R+D) needed for forming the product pattern is a question highly disputed in the literature. In our survey we examined not the demand for R+D but the question of how far the following factors are deterministic in choosing the way of development: the existence of the enterprise's own research basis and the availability or shortage of equipment, the need for external cooperation; and finally, how R+D is financed.

Our sample showed that, on the average, all these factors are ranked by the enterprises as having little or medium weight. This is, however, contradictory to accepted opinion. This has no unequivocal explanation; one of the reasons is the well known fact of inadequate utilization of creative mental capacity: the limitation to development is not the R+D basis; "if it is really necessary, the task can be solved" – is the general idea. A further cause is inadvertency, under-estimation or failing recognition of the importance of research and development in shaping the future. It is, however, a *warning sign* and can be seen from the enterprise responses that organizational rearrangement³ of the development units in itself can hardly provide the more "scientific" and perspective foundations of technological development. It may at most promote their practical utilization to the degree that they meet a rather moderate level of demand. This finding of ours is supported by the role the particular elements play in the various life cycle groups.

³Up to recent times most of Hungarian industrial research institutes worked as independent institutions of the Academy of Sciences or of a ministry. Several institutes have been incorporated into the organization of the enterprise engaged in the production of the related products and directly utilizing the research results.

To possess a research basis is an important condition for the enterprise to *modernize functionally* or, respectively, renew its current products. Regarding these products it is in fact the producer who has adequate tradition. But it is, at the same time, obvious that with respect to new products alien to the traditional range of manufacture – and, to a certain degree, in that of other new products – they require more cooperation with *external research and development organizations*.

At the same time – and this seems to be the greatest contradiction – the enterprises entirely agreed in saying that *their own research basis* met demands.

As far as the two fields of engineering, linked most closely to technological development, i.e., *construction of the product* and *production technology* (that is, working out the detailed documentation of product design and of the manufacturing process) are concerned, we surveyed the influence of novelty of the task, the extent, the education standards and composition of the staff. *These were deemed more important by the experts*. The novelty of both construction and production technology is outstandingly significant in selecting the method of development. This is logical in itself though contradictory to the picture given on research and development. It indicates that the border between R+D and engineering in preparation is drawn by the enterprises practically not at the place where the categories, as interpreted by theory, would make it justified. In practice a greater significance is attributed to the realizing phase of development, i.e., modernization of the actual products and manufacturing technology, while the activities of R+D are considered rather abstract. If this is true, this constitutes another contradiction. Namely, according to the assessment no special problems arose either in the number of *designers* and *technologists* or in the *qualification and composition* of the staff, though the role of these is considered essential from the views of possibilities of development.

Hence the question arises: do all the deficiencies of our products, harming competitiveness, reputation and operation, result from the manufacturing process due to the neglect of design prescriptions and technological instructions or is it the lack of care we touched upon in the foregoing and under-estimation of design work and production technology? Devaluation on a social level is well-known, to do away with it has been put on the agenda.

In the qualification of the products by groups of novelty the following are noteworthy. It is obvious that in the case of products, foreign to the traditional range of manufacture, the *novelty of the task is a prominent factor*. But, in opposition to the given opinions, it is hardly believable that the technological preparation of manufacturing *modernized* products involves higher requirements than those of the new products, with emphasis on assuring good quality for the long run. It is also remarkable that in view of almost all factors the products *modernized in their function* are the most demanding.

2.4. *The Characteristics of Cooperation*

It is well-known that most products of the engineering industry are very complex. They are built up of a great number (several hundreds or thousands) of components

or assembly units (in the following we will mention these as elements) and by using hundreds of materials. The development of a new product or modernization of an existing one is largely influenced by the following questions: (a) what is the share of the elements available in the form of ready-made goods from stock; (b) what are the circumstances of purchasing and supplying the special materials and other elements as far as imports are concerned; (c) which are the elements that must be manufactured locally and what are the conditions of doing so?

Depending on the source from which the enterprise, manufacturing the end-product, provides the semi-finished elements and components, we distinguish three types:

- elements manufactured within the enterprise, maybe by cooperation between plants;
- elements manufactured partly or completely in cooperation, and
- elements purchased as commercial goods, with occasional reprocessing.

The following distribution was found in our base sample: two-thirds of the components were home-made, one-fifth came from commercial sources (domestic or import) and less than one-seventh is the ratio of the elements supplied by cooperation partners.

In industrialized capitalist countries the proportion between in-house production and other sources of component supply is just the reverse: two-third, or three-fourth are not manufactured by the producers of the end product, and even the remaining part is produced because of policy considerations.

A survey of the different life-cycle groups gives no better results either.

Among new products, alien to the standard product line of the firm, the share of the home-made elements is extraordinarily high. It is easy to understand why in standard products of the enterprise the share of these was higher than average. With new products of the standards line a favourable development could be noticed in the increase of the share of components acquired from commercial sources or cooperation.

By comparing the composition of the parts in the products *before and after modernization* no shift was found in the proportions. In the manufacture of the *modernized* products the ratio of cooperation increased somewhat at the cost of commercial articles.

This is not the only sign showing that there is no progress in cooperation. The effect of development on the division of labour in production is negligible or moderate; some improvement can only be found in the case of new products of the standard line.

The share of cooperation is low and this has two negative consequences on technological development:

1. Less than half of cooperation agreements is aimed at technological specialization, the rest at the expansion of capacity. The elements provided by the partners are made at best by the same universal production technology, also available for the producer of the end product.
2. Even the long-term cooperation contracts often have a "permanently provisional" character. No such connections have developed between the manufacturer of

the product and the cooperating partner which would have a modernization effect on the products. The task usually being merely to fulfil the current orders, the collaborating partner makes no arrangements for co-ordinated development or for long-term up-to-date and economical production of the component part in question.

This results in parallel research and development of uniform elements, requiring a surplus of intellectual work without bringing about competitive products on higher levels of technology. The production volume is dispersed, no processes can be introduced ensuring higher productivity and better quality. Owing to the repeated "starts from the outset", the terms of both design work and manufacturing, as well as of ripening the product are too long. Owing to the innumerable individual variants it is difficult to solve the supply of spare parts through the channels of trade.

2.5 *The Background of the Enterprises' own Production*

This title is aimed at embracing practically the entire technological and production basis of industrial (in this case the engineering industrial) enterprises. The composition of the stock of fixed assets was also a subject to detailed analysis both in quantity and quality. Here we limit ourselves to some statements reflecting the findings of earlier surveys expounded elsewhere.⁴ The most substantial experiences are the following:

- The available machine park can be applied in a wide range of technology, thus making the modernization of the product pattern and a flexible adjustment to the market possible. Among the recently purchased production equipment too only a fraction are single-purpose machines, which can only be used for producing a certain component of a single product.

- Production equipment is larger than the manpower available for its operation. There are still significant reserves, however, in utilizing the best part of machinery by working shifts or in operating them at a higher rate of intensity. Among the factors, determining the development process, the influence of fixed assets plays the least part in any of the life-cycle groups.

The supply of tools and fixtures, a basic condition of operating the production equipment, has, along with labour, only a moderate influence. Consequently the given characteristics of the enterprises' own production basis is no delimiting factor in modifying the product structure, or bringing it up to date. It must be strongly emphasized at the same time that in addition to the convertibility of the machine park, another *indispensable condition* of flexible modifications in the product pattern is the opportunity of prompt purchase and setup of equipment necessary to the solution of special technological tasks (for the fulfilment of new structural requirements and the realization of higher quality standards).

⁴Parányi, Gy.: *Korszerűsítő fejlesztés* (Development Aiming at Modernization). Közgazdasági és Jogi Kiadó, Budapest 1983.

3. Conclusions

Earlier, in the system of directive planning, the industrial subsectors were the basic units of planned development. By now competitiveness requires the differentiated technological development and the transformation of the product structure of the level of product groups and individual products. Accordingly, planning the product pattern is today the task of enterprise planning. In the new situation, however, the danger of a new kind of one-sidedness arises.

For example, the trends of development may become blurred behind several individual enterprise actions and this may restrict the system of conditions – which is external to the enterprises – to develop in the desired direction by *means of the industrial policy*. In order to decide what should be the role of complete product replacement and product redesign within the general strategy of modernization of the product structure a deeper consideration is needed. This is part of the general question: on what areas should Hungarian industrial exports concentrate; i.e., which are the fields where we are able to compete with the products of the advanced industrial countries and where should we strive to deliver reliable products of medium quality i.e. being on a lower technological and cultural level? It is the task of industrial policy to take a position in this conceptual problem and to adjust its control measures and preferences to it.

Namely, as our survey has spectacularly proven, it is not only the marketing possibilities and the tasks, but also the *system of conditions* that is different in the case of various types of development. Taking all this into consideration, the reality of the objectives, the conditions and the results indicate that development was most harmonious with products which were *essentially modernized as to their use value*. This product group is built on existing tradition and conditions where we can keep abreast with continuous international development. In the forefront of our efforts are: to obtain higher prices, increase exportability, improve quality and observe foreign prescriptions.

This kind of a balanced situation can much less be found in the group of *new* products. Due to the novelty of the products and the lack of experience, obviously a lot of questions are open, with the exception that in the enterprises' view these products are highly competitive. They do not take a number of factors i.e. the risk of failure and the growth of production forecast into account sufficiently. A *goal in our strategy* can be to develop the product structure mainly by *functional modernization*, as a successful method of increasing marketability. Considering our endowments, the present potentials of industry, this endeavour seems to be realistic, of course, not as a compromise to the absolutely new products as "ideal" ones, but as a strategic goal in addition to them.

International experience also indicates that, despite the strong competition, even the capitalist enterprises are careful in introducing products which are entirely new. In the engineering industry of the United States it is a "golden rule" that the ratio of entirely new elements in a new product, not manufactured so far, may be at 15–20 percent maximum.

At this point, however, a circumstance rather different from our domestic situation

must be taken into account. Namely, that the above ratio applies to the product as a *final* one. Since the overwhelming majority of the product elements are manufactured in specialized factories as *end products*, and these are also continually developed, the modernization in the final product is of a much higher degree. The risk of the development is, in turn, much less, because the assembling enterprise, at the end of the chain of division of labour, is responsible merely for its "own" share of novelty.

Of course, changing or replacing the products, modernizing them, or the other variants are not categories excluding one another, but may exist side by side. But in the case of adopting one of them as a *general method* in any of the production branches (a) it must become a conscious, declared policy and (b) the entire system of conditions must be elaborated and asserted in the enterprise as well as in the industrial policy of the government.

Since the limitations and basic principles of the development methods often counter each other, the principles to be asserted do not support exclusively any one of the methods. Therefore the measures which assure the opportunity of consistent, rapid development in the main directions, assert their effect also on development in general.

Some recommendations to the realization of the development strategy of the *modernization type*:

On enterprise level it is an important condition to bring the whole system of marketing, product planning and production, the control and organization into harmony with the requirements of the given type of development. For the sake of rapid reactions and rapid turn-out of new variants it is needed to apply the principles of product families, construction sets, the connected system of registering technical documentation, flexible and adjustable production technology (related types of machines and tools), technological processes typical of the products, methods of production control based on team-work. Widespread cooperation contacts and systems of commercial information are further indispensable conditions.

In the sphere of *government control* the resources, namely research, the development of the technological bases, the policy of credits, the division of labour within the engineering industry, market policy need to be concentrated on most rapid, qualified development of the "traditional products", on extending and stabilizing their market and on developing the services necessary for these purposes. Such efforts ought to be remunerated, and the support of real novelty concentrated on products which are promising.

From among the tasks addressed to industrial policy we wish to emphasize only one and this is the necessity of a *break-through* in the specialization of components and parts production.

In essence it is the quality of the elements in the products that determines (at present: limits) the standard and quality of the products built. For this reason the promotion of establishing and strengthening productive (and trading) organizations which specialize in characteristic elements of machines, parts, technological operations should be treated as tasks of high priority. The production units serving for these purposes must become appropriate to meet national (international) demand in their narrow, specialized range of manufacture. Within this, they have to grow fit for *research and development*, for the design of the elements and variants in conformity

with the particular demands, for the manufacture, maintenance and repair of them in good quality and productively, both in the form of cooperation, or for the purposes of trading and stockpiling.

THE CAPACITY TO INNOVATE IN HUNGARIAN ENTERPRISES

GÁBOR HOVÁNYI

The Background

Hungary falls in the middle range of industrialized countries considering its technological and economic achievements. But to guard this place in our era of accelerated technological development or to catch up with countries of more advanced technology, Hungary needs to innovate in many segments of the economy. This points to the *great importance of innovation* – above all innovation in industry, the branch that is the main source of GDP in Hungary.

Innovation in industry is realized on the enterprise level. But in a planned economy where economic regulators are aimed at the fulfilment of the plan – which is the case in Hungary – it is decisive for the government to know the endeavors, motives, limits and possibilities of the *enterprises*. That was the reason why the Research Institute of Industrial Economics of the Hungarian Academy of Sciences started a research to reveal the industrial enterprises' attitude towards innovations.

The research comprised 19 Hungarian industrial enterprises and their chief executives (every branch of industry was represented by two or three large companies), 28 more or less successful cases of innovations and 220 middle managers, working at the above companies. The techniques used in the research were case studies, questionnaires and interviews.

In the following I shall try to summarize the main findings of our research.

The General Outline Research

To establish a solid base for the research we set up three innovation models: the first one described the *process of innovation*, the second represented the *innovation chain* and the third introduced a new concept in the theory of innovation, the *field of innovation*. Let me enumerate some specific characteristics of the models.

– The process of innovation model was based on the clearly discernable innovation *readiness and ability* of the enterprises, influenced strongly by the social climate and the economic regulators of the planning system of the country. (The research proved that different incentives have to be introduced to stimulate the readiness or to increase the ability of an enterprise and its employees.) The innovation process can be realized on three levels: as a *project* with heavy investments, as a *programme* using available resources on a long-term basis, or as an *action* mobilizing available resources in the short run. (It has become clear that different management systems are

necessary to control different kinds of processes. The final stage of a market-oriented innovation process is not selling or consumption, nor the feedback of information but the *transfer* and *dissemination* of the innovation. (The research has proved that a huge resource of efficiency is provided simply by the lack of spontaneous transfer and the neglect of deliberate dissemination by governmental organizations.)

– The innovation chain model examined the characteristics of the *cooperation* of R+D institutes, component producing companies, assembling companies, trading and servicing companies in the realization of innovations. This investigation was based on the continuous feed-back of the evaluations of one phase's results to the previous phase, scrutinizing its contribution to the results. This kind of investigation revealed the characteristic breaking points of the innovation chain: the inconsistent *interests* of the cooperating companies, *shortages* in the supply etc. (It has become clear that some changes are needed not only in the incentive system but also in the organization structure of the economy – both are tasks of the government – to solve the problems of motivation and shortages.)

– The field of innovation requires an integrated analysis of the factors of the innovation processes and chains together with the factors of the *economic, social* and *cultural* life of the country, connected with similar events and trends on a *worldwide scale*. It has also turned out that – following the typical situation of firms in technology, marketing and international competition – there are some specific forces in the innovation field, to which the innovation requirements and abilities of the enterprises respond. To fulfil those requirements and to fit their abilities different factors of the innovation processes and chains have to be stressed by the firms' management. The *typical combination* of the different factors, however, renders the planning, organisation and control of innovation easier for the managers – and helps the governments, too, when they have to assess different innovation plans to decide the way and degree of support.

The research on the innovation readiness and ability of enterprises and their employees began with formulating and checking those three models.

The Innovation Process

Looking at the features of the innovation process our first aim was to find and weigh the motives of *starting* innovations. Examining the processes of the sample we have found that the motives derive from

- marketing problems in 22 cases,
- R+D aims in 18 cases,
- company strategy in 18 cases,
- financial incentives in 8 cases and
- governmental initiatives in 2 cases.

The first source clearly shows the importance of the market and its impact on the enterprises, even in a planned economy, if it is efficiently controlled by the government's economic regulators.

Table 1

**Main motives of the innovation processes
in the 28 Hungarian innovations examined**

Motives	Area where the motives fit into	Number of effects ^a
To follow the technological trends	R+D	6
Growth of exports on Western markets	marketing	5
To follow market demands	marketing	5
Fitting into the strategic goals of the enterprise	corporate strategy	5
Substitution of Western imports by home made products	finance	4
More profitable sales	marketing	4
Closing of the technological gap of the enterprise and its competitors	R+D	4
Diversification	corporate strategy	3
Stimulation of the company's growth by international industrial cooperations	corporate strategy	3
Change of the consumer's buying habits	marketing	3

^aOne motive influenced more than one innovation process.

Table 1 shows the most decisive 10 motives of the above comprehensive list. (The whole number of motives was 29.) The figures of *Table 1* show that the two motives stressed by the Hungarian government in the 1980s, namely growth of exports to Western markets and substitution of imports by home made products, played an important role in stimulating innovation processes on company level. Further investigation demonstrated that its cause had not been administrative interference, but favorable credits and subsidies – i.e. economic regulators of the economic directive system.

Lesser results have been achieved by *planning* and *organizing* the innovation processes. It is well-known that many special planning and organizing methods are available to stimulate and accelerate the process. The sample of our research testified that the 28 innovation processes were realized in different organization structure, following the data of *Table 2*. It is convincing from the table that the traditional hierarchical structure of a company has been far less successful from the point of view of planning and organizing the innovation process: based on the traditional hierarchical structure, 6:5 was the rate of successful and unsuccessful innovations. All the other non-traditional forms of organization turned out to be more successful

than this. But it also emerged that the specific innovation centered organization structures are applied only in a scattered way by the managements of the investigated companies. This also seems to be a real brake on the efficiency of innovation processes of many Hungarian companies, not belonging to the present sample.

Table 2

The organization structures of the sample's innovation processes^a and the frequency of their application

Organization structures	Frequency of their application ^b	
	in successful	in unsuccessful
	innovation processes	
Traditional hierarchical structure of the company	6	5
New innovation unit fit into the traditional structure of the company	5	1
Innovation manager in a matrix management system	6	2
Innovation team created by in-company professionals	6	1
Innovation team created by internal and external professionals	2	1
Innovation process with the cooperation of external institutes, firms, etc.	7	2
Innovation process realized by an independent external institute or firm	1	—
Innovation process realized by a newly created subsidiary of the company	1	—
Innovation process realized by a newly created subsidiary of many companies	3	1

^a28 innovation processes in all

^bAn innovation process can belong to more than one of the enumerated structures.

All this supports the idea that organization structures of Hungarian companies are *too rigid* for the international competition of our days.

The Innovation Chain

The first topic of the research of innovation chains was the *source* of innovation, namely: in what a percentage did the idea of innovation arise from the innovating industrial company itself or from other (external) sources? For that special purpose

we investigated all innovations of a three-year-period in the 19 enterprises of our sample. The results are represented by companies, as a percentage of all sources in *Table 3*.

Table 3

Sources of innovations in the innovation chain at the investigated enterprises

Sources of innovations in percentage (all sources = 100)

Symbol of the investigated enterprises	External sources							All together
	The innovating company	Research institute	Shipping industrial partner	Processing industrial partner	Shipping trade partner	Selling trade partner	Other sources (government, etc.)	
A	65	5	—	—	5	20	5	35
B	100	—	—	—	—	—	—	—
C	100	—	—	—	—	—	—	—
D	100	—	—	—	—	—	—	—
E	80	—	—	—	15	—	5	20
F	100	—	—	—	—	—	—	—
G	90	10	—	—	—	—	—	10
H	65	30	—	—	—	—	5	35
I	100	—	—	—	—	—	—	—
K	100	—	—	—	—	—	—	—
L	60	10	5	15	—	5	5	40
M	50	10	—	—	5	35	—	50
N	100	—	—	—	—	—	—	—
O	80	5	—	—	—	15	—	20
P	100	—	—	—	—	—	—	—
R	70	10	—	—	—	20	—	30
S	90	—	5	—	—	5	—	10
T	83	5	—	2	—	8	2	17
U	70	20	—	—	—	—	10	30

The figures show that most of the Hungarian companies are far *too introverted*: in 8 companies out of 19 all innovation ideas did originate in the company itself and in 5 others only less than 20 percent of new ideas from external sources. This points also to the information problem: the external information system of the enterprises is quite undeveloped yet. And this has not only technical reasons: the economic

environment of the firms does not force them to build up a more effective information system. In this respect it is clearly a governmental task to change the environment; this can be realized only by changing the economic regulators and/or the organization structure of the economy, stiffening hereby competition.

Naturally the integration of the innovation chain is not limited to the input-output problems of the information systems of the companies, or, better to say, to the communication problems of the professionals and managers working in the enterprises of the chain. The other main factor of integration is the *interest* of the companies and individuals. Our research touched upon that question too. The results proved the thesis that interest on company level must have by and large the same weight at all enterprises of the chain; if one is far less interested in the innovation than the others, the innovation can easily be delayed or torpedoed at the weak point of the chain. Two consequences follow:

- It is impossible to create a general system of motivation by central regulators for all enterprises of all innovation chains. Therefore the difficulty of different interest weights can be overcome only by *lifting the too rigid profiles* of the enterprises. In that case the innovating enterprise can choose the right partners with the same interest weight, even if the cooperation entails a new kind of research, production or trade activity for the partner.

- Establishing an integrated innovation chain has to be the task of only one enterprise, that of the *innovation leader*. But to be able to fulfil this role the innovation leader must have the possibility to influence the incentive and investment funds of the partner enterprises. This means that central regulation has to open up further ways for the *transfer* of interest and investment *funds* between partner firms of the innovation chain.

Our research has proved in the end that flexibility of profile and fund transfer are usually two important conditions of the success of innovations – mainly in smaller countries where domestic competition is often limited for reasons of economies of scale.

The Field of Innovation

The importance of the different factors of the field of innovation has been evaluated by the chief executives and middle managers of the enterprises, 240 managers in all. They marked the importance of each factor on a 0-5 scale. The votes have been added and multiplied by an index number, expressing relative importance. The biggest 10 results are listed in *Table 4*, together with a percentage value of importance if the value of the most important factor equals 100%.

It was expected that the inefficient *incentives* and the lack of financial means for *investments* will be ranked to the two first places. But the high ranking of *infrastructural* problems was a real surprise for the research team. (The infrastructure of innovation consists of the information, R+D, financial, legal and educational systems on the national economy level.) This supported the idea that government has the duty to reassess from the point of view of innovation readiness and ability not only the

Table 4

Weights of importance of the factors influencing the field of innovation

Factors	Weighted importance	Percentage of importance if the most important factor is 100
Lack of an efficient incentive system at company level	514.8	100
Lack of financial means for investments at company level	492.9	95
Undeveloped infrastructure of innovations at national economy level	417.5	81
Outdated means of production	379.8	73
Inefficiency of the economic direction system at national economy level (regulators, etc.)	379.4	73
Insufficient skill and structure of the labour force	368.0	71
Inefficiency of company management	348.4	67
Unfavorable market conditions	347.2	67
Lack of communication including idle runs of the information systems	301.0	58
Inefficiency of the partner relations in the innovation chain	298.2	57

Table 5

Efficacy of Punitive and Rewarding Regulators, According to the Opinion of 440 Managers

Regulators as factors of the field of innovation	Nature of the regulator	Efficacy of the regulator measured on a 0–10 degree scale (0=min., 10=max. efficacy)
More strict market conditions enforced by the government	punitive	6.1
More strict company profit regulation by the government	punitive	4.0
More abundant company sources for the better exploitation of technological and marketing possibilities	rewarding	7.0
More abundant company fund to increase the personal incomes of employees	rewarding	7.6

management system of the economy, the regulators and the organization structure of the company level but also the elements of the infrastructure, e.g. whether the educational system serves the ability of individuals to innovate well.

Another part of the research, on problems of the field of innovation, dealt with a special question: is the pushing (punitive) or the *pulling* (rewarding) effect of the central regulatory system more effective? The answer can be found in *Table 5*, where the first two regulators are of punitive, the second two of rewarding nature. It is clear from the data that – following the opinion of the 240 managers – the rewards are more effective: the difference between the two extreme values (4.0 and 7.6) is 3.6 on the 0–10 degree scale. The lesson is unambiguous. The Hungarian regulatory system has operated till now mainly with pushing regulators of punitive nature; it would be more effective to use pulling regulators of rewarding nature in a greater extent – even taking into consideration that pulling is more risky than pushing in market conditions where demand exceeds supply.

Some Human Factors

In the last part of our research we have tried to reveal some characteristics of the human factors, influencing the success of the innovation processes of the Hungarian enterprises. We started with two opinion polls. First we investigated the opinions of 220 middle managers: what kind of *managerial skills* of chief executives do they consider the most important to be developed for the increase of the company's innovation readiness and ability? The answers could be marked on a scale where 0 meant no importance and 10 the maximum importance of the development of the given skill. The average values of the 10 most important skills are presented in the third column of *Table 6*. It can be gleaned from the last column of the table that the lesson drawn from the 28 innovation case studies is slightly different from the ranking of the middle managers: we ranked the skills of better forecasting and planning (including market requirements) in the first place which was followed by the tasks of motivation and those of the development of the organizational skills.

In the second opinion poll we asked the middle managers of the sample to rank the necessity of developing the different incentives to improve the *human characteristics* of the company's experts and employees and by those the company's innovation readiness and ability. Their opinion is reflected in the first three columns of *Table 7*. Our 28 case studies of innovation processes showed that the human characteristics of experts and employees have to be developed mainly in three groupings: the first is connected with quality and work intensity, the second with incentives and the third with knowledge and skill. As can be seen in the last column of the table, these findings correspond very well with the results of the poll.

In the last part of the research our aim was to express the *latent innovation capacity* of experts and employees in a rough figure. We have gathered opinions about the difference of innovation ability of individuals when they work in their working-place in usual circumstances, and in one of the forms of "In-House Economic Cooperative" (IHEC). (In Hungary top management has the right to permit the

Table 6

**The chief executives' managerial skills to be developed in the first place
for the increase of the companies' innovation readiness and ability**

Sequence of the opinion poll	Managerial skills	Average values of the opinions of 220 middle managers ^a	Sequence suggested by the investigation of the 28 case studies
1	Increase of the ability of decision-making	7.1	5
2	Right choice of collaborators in company management	6.9	4
3	More efficient incentives and motivation systems	6.9	2a
4	Better forecasting	6.7	1a
5	More efficient inter-company coordination	6.6	7
6	Development of organization skill (coordination within the company)	6.5	3
7	Better perception of new business prospects	6.4	1c
8	Increase of risk-taking willingness	6.3	6
9	Forming a better atmosphere for creativity at the company	6.3	2b
10	Better understanding of marketing impulses	6.3	1b

^awhere 0 = minimum of importance, 10 = maximum of importance

voluntary formation of IHECs of about 10–50 people to work overtime with the company's tools, equipments etc. for the company or directly for the market, under a special Company-IHEC contract. In the average the IHEC work of the employees is one and a half time more intensive than during the main shift and the hourly earning of the IHEC members in IHEC hours is the double of their hourly wage in the 8 hours working time.) The 240 top and middle managers of the sample estimated that the innovation readiness and ability in the IHEC time is three times as big as in the main shift – at least concerning smaller innovations. This means that the latent innovation capacity is double of the manifested one, this points to huge human reserves also in productivity, inadmissible in the scarce financial conditions and worsening international competitiveness of today's Hungary.

**Necessity of development of different incentives and human characteristics
of experts and senior employees to increase the company's
innovation readiness and ability**

Sequence on the opinion poll	Professionals, and employees, characteristics	Average values of the opinions of 220 middle managers ^a	Sequence suggested by the investigation of the 28 case studies
1	Use of the lively interest of individuals in financial incentives	8.2	2a
2	Increase of the quality oriented discipline of individuals	7.9	1a
3	Increase of the information level of experts	7.9	3b
4	Development of expert skills	7.8	3c
5	Increase of work intensity	7.5	1b
6	Better knowledge of market requirements	7.3	3a
7	Increase of independence on different levels of the organization	7.1	2b
8	Increase of the employees' owners-consciousness	7.0	2c
9	Increase of the employees' inter-disciplinary skills	6.9	3d
10	Systematic exchange of expert experience at home and abroad	6.9	3e

^aWhere 0 = minimum of importance, 10 = maximum of importance

Conclusions

The main results of our research revealed some general lessons for the direction of the economy as well as for the management of the enterprises:

- There are large possibilities to increase nationwide innovation readiness and ability – and by that the quality, productivity and efficiency level – by means of the 'human factors' which do not require large investments or other financial expenses.
- The directive system of the economy has to give way – even under the present unfavorable external conditions – to further decentralization and to more effective stimulation by incentives.
- The economic regulators have to promote easier transfer of capital, profits and interest funds between enterprises to facilitate the integration of the innovation chains.

- Company management has to create – in the possession of the necessary risk funds – bolder innovation strategies, based on more complex forecasting and planning techniques and has to control the innovation process more efficiently, using special management methods for the speeding up the process. If present managements are unsuited for the task, they have to be replaced – this means probably a quite strong reshuffling of top management.

- The social status, income and level of independence of experts and senior employees have to be raised at the enterprises to increase their creativity – but in the same time status, income and independence have to be linked tightly with their current achievements: this means, greater personal mobility is needed in the whole of industry.

The realization of the above requirements may help to put an end to *shortage phenomena*, to *develop domestic competition* also for higher competitiveness on world market level – two marks of a suitable field of innovation and two conditions for a healthy economic climate.

INFORMATION – DECISION – INNOVATION

JUDIT KARSAI

One of the researches carried out by the Research Institute of Industrial Economics of the Hungarian Academy of Sciences in the course of 1983–84 was aimed at the analysis of the competitiveness of enterprises examining the factors influencing their willingness and ability to innovate. In revealing such factors research activity was concentrated first of all on the internal, *enterprise components* of competitiveness, since relations of economic management, political and social conditions had already been analyzed by several other investigations. The decisive results of these investigations are summarized in a study by Gábor *Hoványi* also published in this volume. One of the most important research fields was to examine how *the use of information* influences the innovation ability of Hungarian industrial enterprises and how this effect could be improved. It was a common experience of international and Hungarian research, examining the conditions of innovation at enterprise level, that the success of innovation actions was largely depending on the information available for economic units undertaking innovation.

The relationship between innovation and the enterprise information system was relatively little examined, however, up to now. First of all the revealing of the fact was missing as to what pieces of information as conditional factors do further and impede, respectively, the successful implementation of innovation.

The present article summarizes the results of investigations made by the author. Data are based on the results of interviews and questionnaires made with and filled in, respectively, by 85 leaders of five Hungarian industrial enterprises with a staff of 2-13 thousand, each selected by random sampling and working in various fields and ranks. The correctness of the most important conclusions was confirmed also by a consultation with five other enterprises.

The research examined the information activity of enterprise leaders, interviewed in three dimensions, supposing that their information tasks are differing not only according to functional units and hierarchical management levels, but are modified also in time adjusted to the individual phases of the realization of the innovation process. Accordingly, the three directions of investigation were horizontal information-flows between organizational units of the enterprises, vertical ones between management levels, as well as those changing according to various phases of the innovation process.

Forced Steps

It was an important lesson to be drawn from the investigation that all enterprises had been in a difficult situation prior to undertaking innovation. The main problem resulted first of all from lacking possibilities to export for convertible currencies, due partly to the obsolescence of their products and partly to the depression of some branch or the fact that some plant, previously exporting, had to discontinue this virtue of a high-level decision. Since the separation from Western markets took place precisely at the time when the economic policy of the state strongly stimulated convertible export, enterprises had to reckon with the *disadvantageous* consequences of regulation.

However, the measures that could have prevented the critical situations *had not been taken*. Concerning information this meant that the information system of the enterprises did not forecast the changes occurring even in those cases where this could have been possible.

Thus enterprises in question were *forced* to take certain measures, i.e. the innovation process was started neither when it would have been most topical, nor by the selection of the optimal solution but by seizing the – eventually single – possibility arising at the time of an unavoidable change.

"Selection" was made much more *difficult* by the deficient functioning of the information systems. Since there was no *systematic* observation of information enabling the recognition of economic, market and technical trends, the knowledge of strategies of the competitors, as well as the finding of gaps on the markets that could have been exploited, the information systems delivered no information that would have inspired innovation and a development of new concepts.

In case of all innovations examined the proposal starting innovation came *from outside* of the enterprise, that is the recognition of an actual possibility was due first of all to proposals of future cooperation partners and some potential buyers respectively. Enterprises had to decide mostly on the *single* idea raised, accepting it or not undertaking innovation at all.

Therefore real alternatives were missing. Enterprise departments, participating in the realization of actions resulting in innovation, generally do not even exactly *know* what kind of information they ought to ensure for themselves and other organizational units of the enterprise, respectively, as it turned out in the course of the investigation. The reason for this is that those organizational units and persons, respectively, who have a *proper view* on information processes are missing from the enterprises.

Within enterprises the various departments participating in development actions, acquisition of new markets, etc. are not *uniformly* informed either. This is confirmed by opinions of 62 leaders of the enterprises, drawn into the aforementioned investigation, working in various fields and jobs on the information available for development, trade, economic and production management departments, as well as for enterprise centre and factories. (For the sake of quantification we asked them to assess the information by grading it as usual in the school system.)

Data of the table below indicate that the level of information available to the production lines falls considerably behind that of other fields.

**Average marks referring to the level of information available
for various enterprise fields broken down according to those interviewed**

Groups of leaders interviewed	Qualified enterprise fields					
	Technical	Production	Economic	Trade	Centre	Factories
Technical leaders	3.2	2.9	3.2	3.2	4.2	3.4
Production leaders	3.2	2.6	3.4	3.4	3.8	2.9
Economic leaders	3.5	2.9	3.6	3.2	4.0	3.2
Trade leaders	3.2	3.1	3.3	3.9	3.9	3.1
Those working in the centre	3.5	3.1	3.4	3.5	4.1	3.3
Those working at factories	2.3	2.5	2.9	2.9	3.7	2.8
All interviewed	3.3	2.9	3.4	3.4	4.0	3.2

On the basis of interviews it may be added that specialists, dealing with production at the end of the production process, are under-informed. This is a joint consequence of the low level of mechanization of production management, of frequent forced substitution as well as of the deviating motivation in organizational units, carrying out various activities built on each other.

It may be seen from the table that, concerning their own information, leaders working in the field of trade have the best knowledge. This is, however, in a strong contradiction to the fact that – as it turned out during interviews made with co-workers of other departments – commercial departments are often failing to give appropriate information on market situation, the development of prices, competitors, future intentions of buyers or on circumstances bringing about the success or failure on the market.

The information level of *economic fields*, also favourably valuating their own information level, was often criticized, too. Namely, leaders working in other fields do not feel the information obtained from them on the efficiency of realized deals, expected profitability of planned development projects as well as on accounting of producing units within the enterprise sufficient.

The information level of enterprise *centres*, being the highest according to the table, is not only better than that of the individual factories, but exceeds the level of all functional fields, too. The marks given are likely to mean the relatively better information level of top leaders of enterprises as well as the powerful *concentration* of information.

During the examination of definite cases it turned out that the consideration of enterprises was influenced first of all by *technical* problems and the standpoint of *government agencies* found out in advance.

Top leaders controlling initial information were working usually in technical fields and paid relatively less attention to determining *market demands* and expected needs. They did not analyze the supposed market situation and sales possibilities to be ex-

pected with the running-in of production — by means of forecasts — and in most cases information, required for this, was not gathered.

Information on market segments formed by expected buyers, consumption circumstances and habits, on existing standards as well as on the expected price of the product was very often missing.

Just as in case of the market aspects enterprises paid similarly little attention to decide whether they are *capable at all* to carry out the planned innovation. This question was examined anyway in many places by the future cooperation partner and buyer, respectively, when submitting respective innovation proposals.

In the course of the preparation for the decision-making process relatively little emphasis was given to the profitability of the new activity for the enterprise beside the points of view outlined above. Since enterprises wished to "renew" first of all not in the interest of greater profitability or more efficient functioning, they were *not too keen* on obtaining information of an economic character.

Pieces of information obtained and assessed at the initial stage indicate that enterprises wished to appraise the *risk* undertaken by their innovation only to a small extent. Their attention was much more engaged by obtaining central development sources, achieving excessive export, utilizing unused capacities as well as professional success, therefore, the finding out of the standpoint of government agencies as well as knowledge enabling the realization of innovation in the technical sense were the most valuable pieces of information for them.

The period of preparation for decision-making is characterized by — with the enterprises examined — beside the *onesidedness* of the points of view taken into consideration also by the fact that only a relatively limited number of leaders, working first of all in technical fields and placed at the top of the hierarchy, participated in the process of gathering information, while representatives of other fields without adequate information and possibilities to interfere in the decision-making, were less capable of influencing those decisions mostly determining the outcome of innovation. Since the reconciliation of pieces of information resulting from various sources and representing deviating interests was not solved, decision-making *could not ensure* the correctness of decisions corresponding to all-enterprise interests.

The Organization of the Innovation Process

For most of the enterprises the period of gathering initial information coincided unnoticed with the beginning of preparations for innovation. This happened without having evaluated and institutionally discussed the information obtained in the meantime.

The majority of enterprises did not even *fix* information obtained during initial surveys connected to the innovation. Neither the results expected from innovation nor the conditions to be ensured for their achievement were summarized. Reasons for undertaking innovation, expected difficulties and possible tools to overcome them were not summarized.

With the above summarization missing, the information basis that could have served as a basis of comparison in the course of carrying out the innovation and of the evalua-

tion of changes occurring in the meantime, respectively, was available only in the minds, what is more, sometimes only in the mind of one person in most of the enterprises.

Behind the amalgamation of gathering information and the beginning of innovation there are practically decisions made *much earlier* which determine the outcome of innovations in practice. That is, the judgements were made prior to the detailed analysis, more or less at the time when the idea of innovation was raised.

The *negative effect* of decisions, made in an informal way and at a very early stage, appeared not only in the lack of proper foundation. Namely, early decision-making also meant that the most important supporters of innovation within the enterprise were given a determinant, occasionally even *exclusive* role in decision-making due to their better information. This, however, impeded the control of the truthfulness of information, the clarification of differing opinions and decision-making with the enforcement of "collective wisdom" as well.

In case of *no enterprise*, among those examined, there was a project made which would have controlled the entire process of innovation. In this way missing plans could not determine tasks to be carried out for those participating in and controlling innovation, nor was any schedule for the individual stages of innovation set up adjusted to the final date of completion.

Orders of managing directors, practically replacing detailed plans and determining the range and tasks of participants as well as closing dates of the completion of various works, very briefly gave very little information to all those concerned and provided no basis for making subsequent decisions either.

While the *realization* of innovation within the enterprise including development, production and sales went on with each firm in the *traditional* organization – i.e. in a hierarchical organizational form, following enterprise functions – *independent* organizations were set up in order to further the control and management of tasks in two factories.

Setting up these organizations reflected in both cases the intention that problems connected with innovation should be given special importance. That is, with these two enterprises – where innovation was handled as a "system" – departments responsible for coordination starting with material purchase through the programming of production and ending with sales made a considerable contribution to the relatively smooth realization of innovations.

Independently of the selection of concrete management solutions the outcome of innovations was considerably influenced also by the enterprise leader who had the top control over innovation.

The person of the main coordinator was with each enterprise chosen from among the *top leaders* since this post was fulfilled generally by the managing director or the deputy managing director, the technical director or the leader of some factory. When getting acquainted with the history of innovations it turned out to be *justified* to have one of the top leaders as the leader of innovation since without their authority and various connections the realization of innovation would have presumably come to a deadlock several times.

Information Concerning Development

When following up the outcome of innovations, it turned out that the phase when new concepts had taken some concrete form, that is, appeared in the form of a prototype, sample or organizational proposal, had been the most critical. Namely, in this period problems generally concomitant with the beginning of any new activity arose simultaneously with difficulties resulting from the inadequate preparation, thoughtless start of innovation, wrong decisions made previously as well as based on unexpected changes.

Since the majority of innovations examined consisted of development projects taken over in the form of licence or know-how, developers gathered the decisive part of their information from technical and fashion knowledge *purchased* in the interest of innovation and could rely on their own information system only to a smaller extent. However, the process was slowed down several times by the fact that technical documentation, to be delivered according to agreements, arrived only with great *delay* and sometimes *did not even correspond* to the specification given in the contracts. In case of two factories more extensive own development was required than planned because the technical documentation obtained did not refer to an elaborate and tested equipment and, respectively, the construction concept taken over had to be made suitable for mass production by the adapting enterprise. This, of course, caused special problems.

Altogether one enterprise of the light industry was satisfied with the information obtained since it obtained the West-European specification of the latest fashion in due time and according to contract, therefore its own designing work on concrete models could begin.

Beside the above information, forming the basis of innovation, the exact knowledge of needs and ideas of consumers as well as the expected conditions of application were required for development.

To ensure all this information traditional information channels were not sufficient either, as it turned out. In almost each case solutions *deviating from usual ones* had to be applied, based mainly on cooperation with users, specialized foreign trading companies and cooperation partners going far beyond normal business relations.

Among solutions unusual in the practice of enterprises such ones can be found as, for example, the "leasing" of developers of future users, special advising activity of a representative of the cooperation partner staying permanently on the suite, furthermore the continuous control and opinion by one of the most important potential buyers concerning already elaborated, detailed plans.

Beside difficulties of ensuring adequate information the development period of innovations became much longer than planned also by the circumstance that factories when planning innovation, usually underestimated the capacity required and occasionally not the most suitable departments were made responsible for development, there was no comprehensive appraisal concerning the special knowledge required, the stimulation of those participating in development was not solved, furthermore it occurred too, that the work of various fields collaborating in development could not be properly coordinated.

In overcoming these problems managing directors and technical directors, controlling innovation from the top, were given a very important role taking part in the solution of even the *smallest details* since they considered the success of innovation as a personal matter.

The technical director of a factory — as he mentioned it — worked personally a lot on the new design, filed the sample also at home in order to find out what was wrong with it. The managing director of another factory, controlling innovation, personally checked the preparation of each collection and took an important part in the entire process including materials purchasing and the delivery of finished products, too. In general, even the designs to be manufactured were selected in his presence.

Beside work going on in the development phase *decisions* on the individual questions of realization, continuation, and eventual modification or stopping of innovation had considerable information requirements, too.

Issues discussed at a wider forum in the course of development referred — as confirmed by minutes — first of all to the way of realization of innovation and to detailed questions, in general. Accordingly, the information founding decisions were mainly of a technical character just as determined by the order of business and the decisions made with the participation of the prescribed persons only rarely affected fields other than *technical* ones.

Similarly to decisions made in previous phases of innovation, information connected with the market and demands was delivered usually by *planning and developing* and not by commercial or marketing departments. Representatives of economic and commercial fields had no real part even here due to the lack of information available, therefore their participation in decision-making was only *formal*. Due to this circumstance no real exchange of information, ensuring the verification of information and the complexity of viewpoints to be taken into consideration, took place in connection with decisions.

It is especially striking that the agencies and bodies mentioned above did not analyze thoroughly enough the effects of major changes in the environment or within the enterprises on the given innovation, nor the modification of conditions, taken into account at the beginning of innovation.

Thus it was neglected that the price of one of the most important basic materials increased, estimated market demand decreased, the specification required changed, calculation did not remain topical because of the longer time of implementation, new competitors appeared on the market with products similar to those under development. That is, corporate decisions provided *little basis* for the eventual modification or stopping of innovation despite the fact that very important changes had occurred in initial conditions in the meantime.

Enterprises were informed about changes, outlined above, that had *already occurred*, from technical papers, at exhibitions, through their service network or commercial partners. For being able to take steps preventing negative effects of these changes, however, a certain foresight would have been required, that is, also signals referring to the expected occurrence of events ought to have been followed with attention. For this, however, enterprise information systems providing information enabling first of all *operative* orientation were not suitable. According to the documents examined not even the effects of changes *perceived* were analyzed.

In the lack of viewpoints, expectations and conditions, properly cleared and summarized when starting innovation, the question of considering whether changes or modifications occurred would not query the expedience of the continuation of innovation was not raised anywhere.

Information on Production

While in the phase of development it was mainly the novelty of the topic that caused difficulties for the enterprises examined, in case of manufacturing problems resulted first of all from the ensuring of production factors *in time* as well as from the speed of manufacturing required. Namely, delays occurring in the phase of development had to be compensated usually by the shortening of the period of production preparation, since the final date of realization could not be changed or if so, only with disadvantageous consequences.

Due to the accelerated rate, resulting from the nature of innovation as well as from backwardness, tasks connected with innovation had in most cases to be solved separately from other activities of the enterprise and much more *rapidly* than the usual "normal" working rate.

Since the quality, reliability and price of finished products depended in a determinant way on the material, spare parts and accessories used and built in, respectively, also in case of innovation the real control of *materials purchase* was taken over by those controlling innovation from specialized functional departments either officially or tacitly. Since a considerable part of material could be obtained only from import, changes affected also the competent foreign trading company in several cases.

In case of two enterprises the foreign trading company, having traditional relations with the factories, *proved to be incapable* of obtaining the necessary materials since the time to be spent on purchasing was much shorter than previously or usual in case of other products. Namely, export and import departments of generally big foreign trading companies, working separately from each other, could not keep abreast of the accelerated rate. In one case, for example, such a special office was created with the traditional foreign trading company that dealt exclusively with import and export connected with the given innovation and where also the commercial department of the manufacturing firm was represented.

In the exploration of sources for material, accessories and part units to be purchased the sellers of licences, the cooperation *partners* and the future users did all *help* and this proved to be very useful especially at the time of the first attempts.

Starting continuous production required a *more intensive exchange* of information and much *closer cooperation* than usual by the designing, developing and manufacturing departments of the factories affected because of the novelty of products and the production technology applied, respectively. According to enterprise leaders communication, pointing far beyond official relations, was very frequently required between those working in various special fields in the interest of successful production.

In one factory the development of closer than normal relations was justified by the emergency situation arising because of a very fast turnover time. The so-called experi-

mental manufacturing, started on the basis of incomplete documentation, had to result in excellent quality since the customer judged the acceptability of the product on this basis, making the *participation* of developers in the process of production indispensable.

More circumspection than usual was required also by the preparation of *production programmes* in general. When programming production, especially the *lack of computer* could be strongly felt. The registration of parameters affecting production, as well as the operational order had to be made and set up, respectively, manually. Where attempts were made to computerize the preparation of manufacturing it turned out that the very numerous interim changes, appearing because of the low level of organization, *could not be followed up* by computer, therefore data had to be recorded also manually beside the tables. Regrouping having become necessary of problems in materials purchasing, faulty products as well as programme modifications in partner factories and the evaluation of changes in design, resulting from the modification of buyer's demands, would have required the registration of at least 50–60 changes per day and the processing of consequences from computerized programming.

Difficulties of programming could be overcome only by holding a great number of *coordination meetings*, intervention at the *managerial* level and by means of a special *department* established for this purpose. Even with this a lot of daily intervention had been required in direct production management. Just as in previous phases of innovation also in that of manufacturing the overwhelming part of decisions and measures were taken at top level, that is: control and management were largely *centralized*.

Market Appearance

For the first moment of the market appearance of their innovation — i.e. for declaring their products as finished — the enterprises examined obtained considerable *help* from their future customers and foreign cooperation partners participating in sales, respectively.

With one enterprise, for example, the product inspector of the foreign cooperation partner, staying on the spot, and with another one "test sales" on the domestic market ensured information indispensable at the start.

Yet, none of the enterprises examined was in possession of a *marketing plan* at the time of appearing on the market that would have contained guidelines, scheduling and those responsible for various tasks, becoming actually necessary. A properly elaborated marketing plan would have provided the guarantee for sales promotion, i.e. for influencing the market through communication, planning of the initial price, development of an organization carrying out after-sale services as well as the selection of sales channels to be made *in due time* and on the basis of *identical principles*.

The elaboration of marketing plans was largely impeded by that a considerable part of information required for the preparation of a programme was *not available* and this was a consequence first of all of the deficient information, obtained when selecting and planning innovation, as well as in the course of market research made prior to the manufacturing phase.

Appearing on the market with the product declared as finished included – and this was an important element – also the *information* provided for potential buyers on the innovation. Little attention was paid to the preparation of this by the enterprises entering independently into the market, in general.

The fact that the publicity given to products was usually not thought over properly, made not in due time and without aiming at potential buyers was a direct consequence of that market viewpoints had always been pushed into background over the entire process of innovation.

The lack of elaborating an appropriate market policy to be followed up as well as of market research founding this influenced also the fixing of the *prices* of products.

For example, the price fixed at the beginning of market introduction had to be reduced to less than half on the basis of market signals in case of an innovation. Namely, the top leader, deciding the price, offered the price without asking the foreign trading company or the commercial department of his own factory, though he had no inkling about market prices of products similar to the new product of the factory.

The situation of another factory, appearing with a product being novelty even on the world market, was made more difficult by the lack of experience in determining prices, since they had always been in a price-following position previously.

Since at the enterprises examined no system *feeding back* news on the market reception to those participating in realization has been established in general, those controlling innovation at *top level* had relatively the most information on results and failures of individual innovation projects. However, an analysis comparing original ideas and objectives with the real situation did not take place even at the level of top leaders. *Thus no complex evaluation* of innovation took place in general that could have furthered later innovation processes and the further development of individual innovation projects, respectively, with the enterprise. The lack of exact recalculation had also considerably delayed the judgement on profitability with several enterprises and just also the mapping of strong and weak points of manufacturing.

Forced Accommodation

Summarizing the experience of research it turns out that in the Hungarian industrial enterprises examined the level of their information systems did not ensure the information required for the realization of innovation through the running of these systems. Accordingly, enterprises organized the gathering of a considerable part of information regarded necessary mainly by "manual control", i.e. individually.

Individual solutions and special measures applied by the enterprises which, after all, enabled the obtaining and utilization of the most important pieces of information in case of realized – and thus successful – innovation processes clearly indicate the *forced accommodation* of innovation to the underdevelopment of the information system.

Forced accommodation manifests itself already in that enterprises can choose mainly only such *types* of innovation which may ensure otherwise missing information for them – for example in the form of licence purchases or cooperation agree-

ments. By choosing innovation enabling also the purchase of information, however, only a certain part of information and knowledge required may be obtained. Pieces of information taken over may be utilized mainly in the course of realization of innovation but they provide no adequate help in the preparation of decisions furthering the selection and interim modification of innovation. This fact is well demonstrated by several innovation projects, started with delay from the very beginning as a forced measure and without any alternative in their majority.

It may be considered also as an accommodation to the underdeveloped information systems that enterprises solve the *organization* of exchange of information in case of innovation often in a way deviating from otherwise usual channels. Namely, the organization of innovation and the control of its information process is cared for generally not by traditional hierarchical order of the functioning enterprises but by a coordination of control and within this an exchange of information in the hands of the top leader, looking after innovation and of this apparatus, respectively.

In case of innovation projects, realized in practice, the task of ensuring the most important pieces of information had to be fulfilled exclusively by highly ranked leaders sponsoring the innovation. However, a considerable part of information and knowledge required for them was not delivered by the individual special enterprise fields and by their medium-level leaders, respectively, but was gathered by top leaders controlling innovation directly, through their extensive external relations and influence within the enterprise. Thus, however, the enterprises with a relatively larger staff examined failed to utilize precisely those advantages resulting from their size, mainly excessive knowledge that could have been ensured by their specialized departments.

The large-scale concentration of information in the hands of one of the top leaders makes the verification of information more difficult and increases the possibility of errors on the part of such leaders. Since they have the most information on innovation, the overwhelming part of decisions concerning innovation is made within their sphere of authority, even if decision-making happens through various bodies in many cases, but only formally.

The information of other leaders, working in various special fields but not participating in the realization of innovation directly, is endured only to a small extent by the above solution of supplying information for innovation. Orientation and clear-sightedness are made difficult apart from the above also by that the process of innovation is only rarely or not at all interrupted by an evaluation, comparing objectives to the results achieved and deciding on continuation.

As a consequence of all this the method of orientation and decision-making applied in the case of innovation *does not ensure* the correctness and correspondence to all-enterprise interests of enterprise decisions connected with innovation. Too much depends on the person, his motivation and possibilities, abilities and attitudes controlling innovation.

In the field of supplying information for innovation a considerable change may be imagined only if the economic mechanism, developed further in a complex way, raises new requirements toward enterprises, that is, if the further development of the reform strengthens the pressures bearing on the information systems of enterprises.

Parallel to this the *internal motivation and decision-making system* of enterprises has to be rendered capable of meeting increased information demands. Changing internal motivation of enterprises in a direction that economic units will be judged according to the useful performance made in the interest of the enterprise will automatically raise the rank of information required for a given performance and increase the claim to obtain information.

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ON THE EFFICIENCY OF THE PURCHASE AND APPLICATION OF LICENCES

MAGDOLNA GARAMI

The acceleration of technological progress belongs to the characteristic features of our age. As an effect of this process products and technologies are changing more and more rapidly. Products and technologies considered as up-to-date at present may become outdated already by tomorrow. The average lifetime of products is decreasing too. At the same time the manufacturing of a modern industrial product or the introduction of an up-to-date procedure are often preceded by preparatory, research, design, execution and development works lasting for years. Making this process shorter is a very important task from the viewpoint of both up-to-dateness and profitability. The solution of this task may be served by the take-over and efficient application of existing technical knowledge.

International trade – selling and buying – of technical knowledge is a form of international division of labour, having become very important during the last two decades. The import of technical knowledge enables selective research activity, the concentration of resources, the shortening of the realization time of development projects, the decrease of differences in technological levels, the acceleration of economic growth as well as the increase of the efficiency of social production.

Favourable effects of development projects realized on the basis of licences¹ are, however, often not up to expectations and several unexpected, unfavourable consequences may emerge. In case of a concrete technological development project potential benefits of the take-over of certain knowledge may be utilized only if the questions "why?", "what?", "from whom?", "when?", "who?" and "how?" can be answered.

In the present article I am going to deal with factors determining the efficiency of the purchase and application of licences.²

¹The interpretation of the notion of licence and licence agreement, respectively, is not uniform. According to certain views any legal relationship involving some mental product is considered a licence, while others consider only legal relationships regulating the trade of technical products protected by patents as a licence. By licence and licence agreement we mean a contractual relationship on the basis of which the licensor is obliged to ensure an effective and legal situation for the licensee that the latter may practically realize and utilize a certain technical solution at a determined level. Three variants of licence agreements are distinguished, namely, those referring to patents, exclusively to know-how services and to trade marks, respectively.

²The article is based on research going on at the Research Institute of Industrial Economics of the Hungarian Academy of Sciences. Conclusions of the research were formulated on the basis of a detailed analysis of 23 licence deals. Out of these 23 cases 16 were realized in the machine in-

The introduction of the domestic production of a new product or technology may happen in two ways, firstly based on own research and development, secondly by the diffusion of existing technical knowledge.

The exchange of technical knowledge is more efficient than domestic research and development if it brings about greater technical and economic returns (measurable by parameters) with identical or less inputs (including also time input).

The efficiency of development by means of licences can often not be quantified – just as it is sometimes the case with own research and development too. At such occasions one can speak of benefits and disadvantages of licences. Nevertheless, factors influencing efficiency may be assessed.

The factors determining the take-over and efficient application of existing technical knowledge are the following:

1. selection of the development objective;
2. processes preparing the take-over of knowledge, adapting and further developing them,
3. personal, material, financial, organizational and other conditions of the realization of processes,
4. terms of realization of the take-over and adaptation of knowledge.

The main criterion of the purchase and efficient application of licences is the harmony and consistency among factors influencing efficiency.

Factors determining the efficiency of development realized on the basis of licences are summarized in *Table 1*.

Objectives of Licence Purchases

Hungarian economic policy expected much from development projects to be realized by means of licence purchases in the 1970's. Starting from hypotheses of international licence trade trends, supported also by statistics, resolutions stimulating the increase of licence purchases were passed one after the other.

Following such resolutions the weight of development projects based on licence purchases increased in Hungarian enterprises. This is indicated also by *Table 2*.

The dynamic growth of the number of products manufactured on the basis of licences and of licences used in production and of enterprises using licences may be well seen from data of the table. In spite of this the range of Hungarian products, realizable on hard currency markets, did not increase according to expectations.

The share of product, manufactured on the basis of licences, within total sales amounted to 3.7 percent in 1976 and to 5.2 percent in 1982. The share of export sales within total sales receipts of licence products amounted to 37.0 percent in 1976 and 36.1 percent in 1982. The share of non-rouble exports within total export sales receipts of licence products amounted to 18.4 percent in 1976 and to 61.5 percent in 1982. According to data formed from the above figures sales of products

(cont. 2.)

dustry, 6 in chemical industry and 1 in metallurgy. In the course of research work several methods were applied. Case studies were made, just as surveys, questionnaires as well as interviews.

Table 1

Factors determining the efficiency of development realized on the basis of licences

Factors of the objective system	Factors of the process system	Factors of the organizational system	Factors of the constraints system
1. Reality of objectives, harmony among objectives and tools	1. Preparation of development based on licences	1. Integration of elements of the innovation chain (R+D+P+R) ^a within the frameworks of the receiving enterprise	1. Personal
2. Consistency of objectives at various (macro- and micro-) levels	1.1 Determining the objectives and way of development		2. Material
3. Development of the entire verticality (joint development of background-, processing- and further processing industries)	1.2 Research of the licence-market, comparison of offers, selection of the favourable variant	2. Strategical, operative and informative sub-systems of the receiving enterprise	3. Financial
4. Development of adaptive systems (where the own R+D capacity is suitable for adaptation and further development of the technology taken over)	1.3 Obtaining of on-site experience with the licensor in its reference factory	3. Statistical and dynamical organizations of enterprises (professional and functional departments, teams)	4. Information system
	1.4 Conclusion and contents of the contract		5. Interestedness
	2. Adaptation		Terms of realization of the development
	2.1 Preparation of adaptation programme		
	2.2 Adaptation		
	2.3 Coordination of adaptation		
	3. Further development		
	3.1 Take-over and adaptation of the product and/or technology further developed by the licensor		
	3.2 Further domestic development of the product or technology taken over		

^aR, D, P and R are abbreviations of the respective words for Research, Development, Production and Realization.

Relevant data on licences utilized in production at present

Branch	Number of enterprises using licences			Number of licences			Number of kinds of products manufactured on the basis of licences		
	1972	1979	1982	1972	1979	1982	1972	1979	1982
Mining	1	2	3	1	2	5	1	3	3
Electric energy industry	—	1	2	—	16	11	—	—	—
Metallurgy	3	14	11	5	31	32	8	33	15
Machine industry	50	85	79	95	200	227	106	302	285
Building material industry	2	9	7	3	18	27	9	21	31
Chemical industry	17	26	26	42	124	156	74	219	284
Light industry	9	33	32	10	40	47	15	66	97
Other industries	1	2	5	5	2	5	5	5	11
Food industry	6	9	8	7	9	8	7	20	37
Socialist industry altogether	89	181	173	168	442	518	225	669	763

manufactured on the basis of licences amounted to 0.25 percent of total sales on dollar markets in 1976 and to 1.15 percent in 1982. This means that developments based on licence purchases brought about no considerable improvement in market positions in convertible relations. Exports of licence products in this relation are usually not profitable for the Hungarian party.

Licence purchases of Hungarian enterprises were often motivated in recent years by the assumption according to which development by means of the adaptation of licences would result in faster technological progress and the products manufactured ensure better market positions than products of own research and development. Practice has often contravened both assumptions.

Although the import of technical knowledge potentially enables also a considerable decrease in the technical gap, the difference between most advanced and domestic technological levels, this possibility has remained only a potential one in the majority of cases. Why? Which are the facts that converted assumptions into unrealistic objectives and potential possibilities into unexploitable situations?

1. Firms representing the world level are usually not willing to sell their most advanced technology, ensuring extraprofits, but offer in most cases those products and technologies for sale which are to some extent already outdated and do not represent most advanced technology any more. If the products or technology offered show more favourable parameters than those to be attained by own research and development or the existing ones then Hungarian enterprises buy them. Its unambiguous result will be that dynamical world level being in permanent motion it may never be attained by the simple adaptation of licences. Not even in the ideal case when the licensor sells the know-how of its most advanced product, because the product

and/or technology taken over in this way become usually outdated during the long time required for domestic adaptation.

2. A simple adaptation is not enough even for following world level. A parallel progress of domestic and world level may be ensured only by the continuous further development of technologies taken over which may, in some exceptional cases, ensure attaining of world level. For further development however, a creative flexible research and development staff is required, interested in their work and properly knowing local particularities. Due to organizational, motivational and other factors attempts aimed at the further development of technologies taken over were not among the most emphasized tasks of Hungarian researchers and development specialists.

3. There are two factors, in general, acting against the improvement of market positions in the dollar relation of products manufactured on the basis of licences. One is a subjective while the other an objective factor. Let us perhaps begin with the subjective factor. The export of products manufactured on the basis of licences is usually strongly limited by the licensor. Direct and unlimited export possibilities are granted only very rarely. In a part of the cases the licensor buys finished products back but only at prices often unfavourable to us. The objective factor is the technological level of products. During the process of adaptation for Hungarian circumstances lasting in a favourable case for three but usually for five to six years, products become outdated and they are often not purchased even in markets of developing countries.

Taking the aforementioned factors into consideration it may be stated that with development by means of licences world level may be followed in favourable cases parallel but only if the rate of further domestic development may keep up with the increase in world level.

In Hungary development projects based on licence purchases are usually not followed by further real development after adaptation, therefore the lag behind the most advanced products of the world becomes greater again. According to the above the efficiency of the technology taken over may be well characterized by the difference between world and domestic technological levels and the *rate of decrease of the technological gap*. With a view to this the only appropriate solution is to buy technologies representing world level at present and intensively develop them further, following adaptation taking economic potential of macro- and micro-level economic units, the available assets and conditions, the contemporary technological level at home, the development level of scientific-technological basis, technical traditions and real development perspectives into consideration.

Another precondition of the efficiency of development by means of licences is that this development should affect not only the enterprises issuing final products, but also the industries manufacturing spare parts and units – called background industry in Hungary – because the level of a given product or technology is determined not only by its own technical and economic parameters but also by the level of the background industry. Concrete cases prove that existing differences between technological levels of the receiving enterprise and its background industry respectively affect the entire outcome of the take-over of technical knowledge. Products of the domestic background industry, the quality of basic materials, intermediary products and fittings do not meet requirements raised by the more advanced technology, to be adapted. There-

fore, adapting enterprises are not fond of buying such technologies which would require large background industry involvement. The background industry – because of various limits on available assets – cannot, and eventually (due to diverging interests) does not even wish to develop its own level and products according to demands of further processing enterprises. The development of the technical level of certain special branches manufacturing final products or of certain products by means of the take-over of technical knowledge may be realized only with a simultaneous development of the background industry.

In an opposite case problems of the background industry being the most frequent impeding factors of the success of licence development projects nowadays will remain also further on. A more considerable technological progress may only be achieved by the complex development of the entire production vertically. Without a developed background industry the increase of basic material and spare parts imports is unavoidable. The effect of imports on the currency balance is not compensated by exports, strongly delimited by licensors.

Hungarian enterprises are usually buying licences when their own research-development background is missing or not appropriate. In 50 percent of the cases examined own research and development – as an alternative possibility – were not even taken into account, while in the other 50 percent of cases buying licences was decided because of the inadequate level of existing research and development activity. Of course, it would have been unrealistic to aim at attaining world level or at least follow it parallel in these cases, because a basic precondition of being able to realize such an aim is the further development of the technology taken over which, however, cannot be imagined without an appropriate own research and development basis. Own research and development may be regarded as a decisive criterion of adaptability.

The task of domestic research and development is the greater in the process of adaptation and further development the greater the difference between domestic level and the level to be adapted. Domestic research and development should bridge or at least considerably decrease differences between world level and domestic technical level. Development based on licences will not be efficient if it is realized for the substitution of domestic research and development.

The lack of own research and development background confronts adaptors with seemingly insolvable tasks. A developed research and development basis, capable of learning something new, may obtain such knowledge when taking over a new technology that may be made good use of even "exponentially" in the process of adaptation and further development, in parallel or subsequent research and development work.

Factors Determining Efficiency in the Process of Take-Over of Knowledge

The success of adaptation is largely influenced by the fact to what extent and to what depth those controlling development "comprehend" the entire process of the takeover of knowledge and how much they are capable of formulating partial tasks exactly.

The process of take-over of technical knowledge may be divided into three partial processes. The partial processes include the following groups of tasks:

Partial process 1: preparation of development

- determining the objective and method of development;
- market research concerning licences, comparison of offers, selection of the favourable variant;
- obtaining of on-site experience with the licensor;
- preparation and conclusion of contract.

Partial process 2: adaptation

- preparation of an adaptation programme;
- adaptation;
- coordination of adaptation;

Partial process 3: running-in of production, further development of the product and/or technology

- take-over and adaptation of results of further development by the licensor;
- further domestic development of the product or technology taken over.

In the following I am going to draw attention to those factors within the groups of tasks which increase or decrease the efficiency of licence actions.

Determining both the objective and the way and method of development may be well founded only following an appropriate decision preparation. Various development possibilities (advantages and disadvantages of domestic research and development as compared to those of a take-over of technical knowledge already applied in foreign countries) may be compared according to possibilities and restrictions of development only then. The preparation of decisions and finally the decision-making process are tasks of the receiving enterprise and it is not expedient to cede decision-making and the related responsibility to other agencies – legally separated from the enterprise. In 50 percent of cases own or domestic research and development as a development alternative were not even taken into account. In these cases take-over of knowledge was aimed at making up for the lack of domestic research and development. In the majority of cases it turned out after all that receiving enterprises were ready but hardly able to adapt the new technology, taken over, efficiently, even less to develop it further because a relatively developed domestic research and development activity is an indispensable precondition of the take-over of knowledge and the decisive criterion of adaptability, respectively.

The next task following the decision in principle referring to the purchase of a licence is the research into the licence-market. Then the enterprise invites potential licensors to bidding. Following (or prior to) such invitations personal consultations take place. Such talks end in failure when experts on technical development or researchers best knowing the subject are not present. Personal consultations of information character are aimed at selecting potential bidders. At such negotiations the partners whom negotiations should begin with on the merits may be decided. It is a frequent problem that only top leaders are participating at preliminary talks. Real technical experts of the given field get acquainted with local and manufacturing experience only following the signing of the contract when there remains no possibility to enforce observations – e.g. modification of technology, selecting appropriate sales representatives for machines, instruments and other equipment, etc.

The comparison of offers and the selection of the most favourable variant are made practically on the basis of two decision-making criteria. Previously meeting domestic market demands and the convertibility of existing machines and equipment had been the primary viewpoint while at present sales possibility in the dollar relation and the convertibility of existing equipment are the two basic criteria. With the conversion of existing equipment and purchases requiring no or hardly any investment adaptors may adapt licences often only at the expense of technological level. Following this comparison on the basis of the above two criteria there remain offers to be evaluated, only then will technical criteria (technical parameters of the product and technology) take some part as factors influencing decision-making.

If it is possible the adaptor gathers production experience on the site in reference works of the licensor prior to signing the licence agreement which is an indispensable precondition of the technical foundation of a proper decision. The exchange of experience provides an excellent possibility to get convinced about the elaborateness of the technology, the seriousness and production relations of the seller. Experience obtained from the manufacturer and also from users is always necessary for a successful adaptation.

Tasks directly preceding the signing of the licence agreement are the preparation of the contract, data supply and proposals for the formulation of the next of the contract. The circumspect formulation of the contract text may eliminate eventual later inconvenience or in the worst case the breaking of the contract. Interests of the licensor and the licensee are after all reconciled in the contract. The contract is the basic document on which the entire action is relying. Obligations undertaken in the contract are the key-points of the outcome of the entire action.

The most important task following the signing of the contract is the preparation of the adaptation programme. With this the second partial process of the take-over of technical knowledge, adaptation begins.

A properly elaborated and thoroughly thought-over programme is an indispensable condition of the success of adaptation. Adaptation programmes are varying, sometimes they are line schedules, while in other cases regularly actualized net diagrams of CPM-PERT type.

The fulfilment of tasks determined in the adaptation programme is the process of adaptation beginning with the study of production technologies and documentation with the enterprise selling the licence (or in a reference factory). Experience obtained on the site enables a considerable shortening of the period required for adaptation, commissioning and running-in as well as the attainment of appropriate product quality and productivity as soon as possible. All these result in considerable material and energy savings, aid the proper use of machines in several cases and thus have a favourable effect also on the lifetime of equipment.

The elaboration of adapted production technologies and the learning of technologies may be promoted by reproduction experiments and experimental production. However, this may be done only rarely. Non-convertible enterprise machinery, the lack of pilot plants and procedures requiring completely new production technique with the enterprise sometimes raise barriers to such reproduction experiments which cannot be surmounted.

A considerable share of technologies imported from abroad comes from capitalist countries. It is a natural consequence of this fact that also materials to be used for production are purchased on capitalist markets when starting production. It is an important task of domestic research and development to substitute raw and basic materials imported from the capitalist countries for domestic materials or those to be obtained from other socialist countries. But this is not an easy task. Licensers are often making the reservation that they undertake the warranty for the technology only when using materials indicated by them. Should this not be the case development specialists are faced with qualitative problems or the shortage of materials and spare parts to be obtained on domestic markets or on those of other socialist countries. This is why convertible currency burdens on current production are considerable even after several years of production.

The majority of licence actions have some investment involvement, too. One of the most frequent reasons for the non-completion of investment projects on time is the inadequate level of the organization of effectuation. Namely, contractors should also have an active part in this beside the one giving the technology, the investor and the designer – which may all be within one enterprise but also various institutions legally separated from each other – practically from the very beginning of the investment project. In the case of several contractors – which is almost always characteristic of major investment projects – contractors are entering the project at various stages of implementation while the entire sphere of contractors is not known at the beginning of the investment project.

The process of adaptation, full of tasks and lasting often for several years, should be coordinated. This is a well-known statement, nevertheless only a few enterprises ensure the organizational conditions of the fulfilment of this important work.

Stages of the running-in of production and the further development of the product and/or technology are demand, possibilities of reducing production costs, revealing of reserves of the technology, improving quality of products meeting nearly identical needs, draw attention to the possibility and necessity of further development, already at the time of adaptation or the running-in of production. There are three ways of further developing the adapted product and/or technology. One is the take-over of results of further development granted by the licensor, the second is own research and development, while the third one is the introduction of the latest results of the licensor's completed with own research and development.

Licensers usually further develop technologies already handed over and frequently participate – by contract – in handing over also the results of further development to buyers. It is the task of domestic research and development to take over and adapt results of further development from the licensor. In all the cases examined licensor further developed the technologies handed over. In ten cases buyers took the developed variants over. In seven cases licensers manufactured considerably more advanced products or used much more advanced technologies within the same product group following the signing of the contract. Results of such considerably more advanced procedures were not taken over but in one case.

Another way of further development is own research and development. This is a more risky venture. Licensers may restrict further development in the contract by

guaranteeing for the technology or undertaking the buying back of products only with the technical and production parameters stipulated in the contract.

The third way of further development is the introduction of the latest results of the licensor completed with own research and development. Enterprise experiences prove that the majority of successful further developments is the fruit of cooperation between the technical and manual staff of the manufacturing departments as well as co-workers of technical development, technological, production and investment departments of the enterprise.

A comprehensive further development of foreign technical knowledge has taken place only seldom in Hungary.

Organizational, Personal, Material and Financial Conditions of the Implementation of Development Projects Based on Licences

Organizations – either legally separated from the adapting enterprise or those working within its framework – involved in the development projects have an important part in the efficiency of development projects based on the take-over of technical knowledge.

The interestedness of different external economic organizations participating in development but legally separated from the adapting enterprise (e.g. research institutes, development and planning enterprises, domestic and foreign trade companies, etc.) is considerably deviating from one another.

If a participating organization – e.g. a research institute – is not interested in the successful, economical implementation of the entire process but only in a more-or-less well defined partial activity, even in this often only to the extent that this activity be displayed with as much "profits" as possible, then its own interests will be confronted with those of the adapting enterprise.

Conflicting interests may influence unfavourably the efficiency of the take-over of technical knowledge. This is why I consider the maximum possible integration of the elements of the innovation chain (research, development, production and sale) into the producing enterprise as very important.

It has already been mentioned that development based on the take-over of knowledge can be more efficient if the enterprise has its own research and development basis. Namely, a problem may best be perceived – if at all – at the place where it arises. Deficiencies may appear for example in the increase of unsold stocks, quality complaints and production costs. The effect of secondary perceptions is weaker. Multiple information-transmission may lead to the deformation of the problem. The deformation of problems and their decreased perception often lead to solution other than expected. This is the case also when the task of research and development reaches the contractor through the hierarchy of institutions (e.g. adapting enterprise, external research institute).

Certainly, a problem may be deformed within the organization of the adapting enterprise also when the process of the take-over of technical knowledge was attached to rigid frameworks of static organizations. In the majority of cases enterprise

organizations participating in the process are functional units working in hierarchically bound (depending on enterprise size) rigid frameworks of group-section-department-directorate. These static organizations have to fulfil first of all routine tasks and display operative activities connected to current production independently of the given development project, they are called to account for the "past and present" and not for the "future", therefore tasks connected with the take-over of knowledge become secondary as against daily activity.

There are, however, also such enterprises – though their number is insignificant as yet – whose organization is time-oriented. A time-oriented enterprise organization is suitable to prepare itself for the future, too, since in its framework the strategic, operative and informative units may be found where a division of tasks connected with the future, present and past is enforced.

The efficiency of the take-over of technical knowledge was improved by teams oriented to concrete development projects.

A factor deteriorating the efficiency of development based on licences is after all the organizational separation of various conditions when interests of organizations are often contradictory and point by no means unambiguously to the direction of the economical realization of development within the shortest possible time.

Mental resources are concentrated basically in sectoral institutes of research and development despite the fact that producing enterprises develop their own research and development basis also within their own organization.

Material conditions of the adaptation of new technology (raw and basic materials, buildings, machines, equipment, etc.) are within the frameworks of the adapting enterprise partly given in case of convertible systems of new investment required for development that may be implemented there. Therefore, material conditions of adaptation can partly or fully be ensured in the organization of the producing enterprise.³

Financial resources aimed at covering adaptation and further development activities are formed primarily with the enterprises then a part of them are centralized and redistributed.

An important condition of the successful take-over of technical knowledge is that the cover needed to finance costs be available in due time. In the cases examined enterprises could only partly finance the costs from own sources (enterprise funds of technical and general development). Another part of costs was covered by central funds of technical development concentrated with the OMF (National Committee for Technical Development) and the sectoral ministries.

Credits granted by the National Bank of Hungary or the National Development Bank and state allowances not to be repaid mean important resources of financing. Licence actions were characterized by the multi-channel system of mixed financing.

³ Aimed at establishing closer connections between research, development and production, organizational changes have recently taken place in Hungary. Some of the previously independent research institutes have become the joint institute of several producing enterprises while others have been reorganized into independent development (engineering) companies. Only a few industrial research institutes have maintained their previous status and line of activity.

Various types of costs (licence fee, costs of adaptation, construction, machine purchase) were financed by several sources – occasionally one type was financed by four sources. For the financing of various costs of one action enterprises sometimes obtained allowances not to be repaid even from several places.

Multi-channel financing and the ways of its realization are dissipating central resources. The variety of subsidies draws important assets away from fields whose development should be given more emphasis, to.

The most favourable way of financing costs is the utilization of own enterprise resources, completed by credit. The utilization of own resources induces those involved in development to proper consideration and decreases the share of unfounded actions. The system of state subsidization may be expedient in case of major investment projects, requiring high expenditure and risks, affecting several sectors and thus raising national interest.

Information conditions of development (technological level, foreign and domestic market relations, prices, price forecasts, etc.) are available for the producing enterprises mostly only indirectly by means of secondary information.

A direct contact with foreign markets is possible only for a few enterprises (having their own right to export). Export sales are realized through foreign trading companies. Even in case of domestic sales only a very small part of them is direct. Only a few enterprises have their own shop network. Enterprises have no direct contact with consumers but their products reach users through the network of wholesale and retail trade. Thus, information pieces of the market reach the producers through transmissions often delayed and sometimes deformed.

Problems resulting from the separation of personal, material, information and financial factors of development (lack of proper information, practical experience, etc.) are aggravated by conflicting interests due to organizational separation.

Beside deviation of interests of economic organizations, legally separated from the adapting enterprise, the situation of adapting enterprises does also unfavourably influence the efficiency of the take-over and application of technical knowledge. Enterprises have been stimulated by industrial management through economic regulators to increase their profits to an extent well predictable to meet domestic demands and to increase their export. If one of these may be achieved by development based on licence then there will be some interest in doing so. On the other hand, however, the achievement of objectives was not forced by economic effects since unfavourable effects were compensated for by the state in the form of various subsidies. Therefore, enterprises refrained from innovation processes aimed at the introduction of either domestic or foreign knowledge involving considerable risks and responsibility. Without coercive economic effects enterprises undertook no risk voluntarily.

The individual interestedness of those participating in processes of the take-over of knowledge is very contradictory, too. Research and development people are, for example, stimulated first of all by the possibility of achieving "own" results especially if these may be used also as patents. Researchers and developers have hardly recognized the possibility, yet, that procedures to be patented or inventions can be made also in the stage of further development of adapted technology.

Conclusions

The potential possibility lying in development by means of licences is no warranty for the gradual approach to world level not even for its parallel follow-up.

The import of technical knowledge will be an efficient tool of technological development only if production and sales structure develops favourably as a result and the difference between the most advanced technological level and that of Hungary decreases. Several conditions have to be ensured to attain the favourable effects. Internal and external, personal, material, financial, organizational, information and interestedness conditions do jointly control the process of the take-over of knowledge toward the direction of the aim set or to a deviating direction.

Providing for one or two factors is not enough for the take-over of knowledge to be successful. The joint provision for all conditions of an efficient licence application will guarantee the real efficiency.

The precondition for a producing enterprise to receive and develop the imported technology further is first of all that it disposes of conditions of research and development within its own organization. If the enterprise adapting the new technology cannot ensure the research and development capacity required for the further development of the technology taken over, if material, financial and interestedness conditions of adaptation and further development are not available then the willingness of the enterprise to buy a licence will be in vain and it will not be possible to import technology efficiently. The existence of the own research and development staff is a decisive criterion of adaptability.

Can development by means of licences be a tactical tool? The answer to this question is: generally no. A licence action is only very rarely favourable in the short run from both technical and economic points of view.

The buying of a licence with the aim of import-substitution may be favourable also in the short run if the time required for its introduction is short, non-recurrent and continuous foreign exchange demand is low, there is no need for imported machines and equipment, domestic raw-, basic- and auxiliary materials may be used for the production.

In the majority of licence-developments the licence fee, non-recurrent and continuous foreign exchange expenditure spoil the foreign exchange balance in the short run but it is not sure either that this will improve even in the long run. Negative effects on the dollar balance may restrict sales in the rouble relation in the short run. This restrictive effect, however, impedes the running-in of production and the utilization of production capacities invested.

Development projects carried out by means of licences have perspectives. In case of such a development project adapting enterprises may obtain such technical knowledge, organizational and production experience which may be made good use of in own research and development. Such a multiplying positive effect may of course be expected only with an enterprise where an adaptive and creative research and development basis is available.

Licence-development may strengthen but not substitute for own research and development.

The experiences obtained in the course of investigations do not deviate from the conclusions of analyses carried out with other institutions nearly at the same time or little later, nor from statements of the latest study of a working group of the National Committee for Technical Development made in 1984 and summarizing the "Experiences of the Take-Over and Application of Foreign Licences". In this way all what has been mentioned in this article reflect the overall Hungarian picture.

SIGNS OF MARKET CHANGES¹ IN THE HUNGARIAN MANUFACTURING INDUSTRY

ÉVA NÁDOR

The shocks of the world economy in the 1970s affected also the Hungarian economy with elementary power. The negative effects, while growing persistent, brought a series of existing problems of economic management to the surface. By the end of the past decade – in opposition to certain earlier views – it became clear that the fundamental question of Hungarian economic development is how it can adjust to the changing conditions of the world market.

The research of foreign markets conducted in the Research Institute of Industrial Economics of the Hungarian Academy of Sciences has been concentrated on the question how the enterprises adapt themselves to world economy and how the success of this adaptation can be increased in the future.

One of the researches restricted its survey to export orientation and, within this, to the orientation to the capitalist markets. In the past years both the scientific and the practicing experts analysed the export activity of the Hungarian industrial companies approaching it from several aspects but did not deal with it expressly in view of the enterprise policies in relation to different markets. The research we are going to present in its main lines in the following deals with export orientation primarily from this point of view.

Under the current economic conditions it is our vital interest to increase the exports to capitalist markets. In want of other conditions of growth this must unequivocally lead to a changing proportion in the selling markets. The shift in these proportions can be achieved on the one hand by restricting domestic consumption and, on the other hand, by transferring a part of the exports directed to socialist countries to capitalist markets.

In the course of our survey we examined whether the endeavours of economic policy asserted themselves in the export activities, i.e., in the formation of the proportions between the export markets of the enterprises of the Hungarian manufacturing industry.

By the aid of processing statistical data and empirical survey we wished to find out whether the development of the exports of the enterprises reflected their adaptation or the efforts of adaptation to the foreign markets. Our statistical analysis was based on the foreign trade data of 442 manufacturing industrial enterprises. The analysis was promoted by personal consultations with experts of the enterprises.

¹In the socialist countries, so in Hungary as well, the proportion between the selling markets is an important characteristic of foreign trade. This means the proportion between the exports paid for in Rbl and non-Rbl currency.

For the analysis the time period between 1978–1982 had been selected. During that time the effects of the changes in the world economy sharpened and the necessity of adjustment to the foreign markets became widely obvious.

Viewpoints to the Evaluation of the Changes Experienced

Before evaluating the market ratios characterizing the exports of the enterprises of the Hungarian manufacturing industry, attention has to be called to the fact that in respect of the micro-spheres of motion there are essential differences between the regulated socialist market and the so-called market economies.

In principle, in an economy regulated by market automatism the proportions of markets within the total exports express the competitiveness and marketability by market categories. Formulating it on micro level, these proportions are basically developed on the joint effects of the internal endowments of the enterprises, of economic efficiency computations and of objective external market factors. In addition to all these, of course, a series of other – political or economic – factors also exert their effects.

In turn, in our economic mechanism the rank order of the factors which determine the distribution of export deliveries by markets – as it has been proven by our survey – differs from that presented above.

The liberty of decisions made by the enterprises or, rather by enterprise management regarding the policy of selecting the export markets is restricted primarily by the volume of sales to the socialist countries fixed by *inter-governmental agreements*. Of course, not all enterprises are affected thereby to the same degree. It is true, however, that the share of exports to socialist markets based on inter-governmental agreements is the highest with the companies which are the greatest exporters. Obviously a really flexible market orientation policy cannot be expected from these enterprises.

In our experience the decisions on exports of the Hungarian enterprises are influenced to a great extent by *expectations* formulated on various levels of socialist leadership and economic management. By all means, changes in the policy of market orientation should be motivated by economic regulation and not by subjective influences.

The way the exports of the enterprises are divided among the markets is highly influenced by *economic management* even under our circumstances, through the export incentives, the exchange rate policy, the tax system, the regulation of imports, etc. It is obvious that the liberty of the enterprises' leaders in their decisions can be restricted by over-regulation, the contradictions and frequent changes of the regulators.

The autonomy of a Hungarian industrial company in respect of its decisions regarding the policy of directing its exports is determined by the above described framework. We deem it a serious deficiency that some basic objective factors, destined to define the policy of export markets, such as market demand on the one hand, technology and capacity of the enterprise on the other, or the view of export profitability, are thrust into the background, as compared to the preceding ones.

A much greater importance ought to be attributed to the objective market conditions than at present. A decline in domestic demand or on behalf of the socialist buying market may be an important motivating factor of the efforts made in order to increase the sales in capitalist markets. At the same time restrictions in the capitalist market should stimulate to introduce changes in the opposite direction. The world-wide economic recession affected all branches of the manufacturing industry heavily, some revival can only be experienced in a few sectors. In the depressed situation of demand the lack of international competitiveness makes it impossible to increase exports to the capitalist markets. At the same time in certain sectors – like e.g. the manufacture of medical instruments – the improving conditions in the market might be a stimulation to increase the exports to capitalist countries.

Alike to the market conditions, attention ought to be paid to the technological standards and capacity of the enterprises, too. Prior to the decisions on changing the market pattern, it is needed to study to what extent this is made feasible in reality by the technology available in the enterprises.

In case the objective circumstances mentioned above do not find expression in the formation of the enterprises' exports by markets, a policy of determining the directions of exports can only be spoken of in a very restricted sense. It must be seen that in developing the policy on export markets, it is necessary to weight the influencing factors in a way quite different from that used today.

The Development of the Proportions of the Markets in the Exports of the Hungarian Manufacturing Industry

The share of the exports to capitalist markets² within the total exports of the manufacturing industry exceeded 50 percent in 1982. Orientation to capitalist markets was especially high in the chemical and in the smaller other branches of industry. In the exports of the engineering industry the share of the capitalist markets did not reach one-third of the total, and the share of the exports to capitalist markets approached 50 percent only in the industry of electric machinery and appliances and in that of metalwares.

In examining the development of the share of exports delivered to capitalist markets by the enterprises of the manufacturing industry within the total exports we grouped the enterprises into three categories in order to facilitate the analysis. The enterprises where this share was below one third were classified as those with a low share, those where it was between one and two thirds as having a medium share, and the enterprises where it was higher than two thirds were considered as having a high share.

On the basis of this certainly arbitrary classification approaching it from the view of the industrial branches, it can be said that in the engineering industry the share of the enterprises showing a low ratio of exports to capitalist markets is higher than the

²By exports to capitalist markets here and in the following we mean the exports paid for in non-Rbl currencies.

**Characteristics of export activities pursued by the enterprises
of the manufacturing industry in 1978–1982**

Characteristics	Value of total exports of the enterprises		Ratio of exports to capitalist countries within total exports	
	thousand Ft		percent	
Industrial branches	1978	1982	1978	1982
Engineering industry	74,041,228	89,779,111	25.5	30.0
Building materials industry	2,468,220	2,750,958	66.1	67.9
Chemical industry	24,244,031	37,912,714	57.4	60.6
Light industry	21,112,608	22,960,695	67.8	49.0
Food industry	20,059,787	57,843,625	97.2	79.5
Other industries	296,792	251,333	70.4	70.9
Manufacturing industry total	142,222,666	211,498,448	43.7	51.6

Source: Statistical Handbooks

Table 2

**Distribution of the enterprises by the ratio of exports
to capitalist markets within exports (in percent)^a**

Branches Ratio of ex- ports to ca- pitalist mar- kets	Engineer- ing	Building materials	Chemical	Light	Food	Other	Manu- factur- ing in- dustry total
Low	50	24	19	23	22	21	32
Medium	24	28	36	31	8	—	25
High	26	48	45	46	70	79	43
Total	100	100	100	100	100	100	100

^aComputations by the author.

average. In a more detailed breakdown the ratio of the exports to capitalist countries is lower than average in the branch of the machines and equipment, in that of transport equipment and in precision engineering. In the sphere of the enterprises belonging to the metalwares industry it is higher than the average.

The tendencies in the ratio of exports to capitalist markets between the years 1978–1982 interested us – as mentioned before – in order to see to what extent the enterprises' economic results come up to the requirements on national economic level and to the implementation of the objectives set in our exports.

When examining the changes in the ratio of capitalist markets within the total of exports we had to draw the border line between changing and stagnation. Only deviations at a degree higher than 3 percent were considered as changes, since even the demands considered permanent may show such degrees of modification.

Table 3

Distribution of enterprises by the changes in the ratio of exports to capitalist markets within total export^a (in percent)

Industrial branches	Engineering	Building materials	Chemical	Light	Food	Other	Manufacturing industry total
Direction of change	industry						
Declining	28	44	35	30	20	16	29
Stagnating	22	25	38	31	55	42	30
Growing	50	31	27	39	25	42	41
Total	100	100	100	100	100	100	100

^aComputations by the author.

In the period analysed changing markets were characteristic of the manufacturing industry. In 70 percent of the enterprises which exported products to capitalist markets certain shift occurred in the market proportions.

In their majority – 40 percent – the changes were characterized by shifts towards the capitalist markets. Between 1978–1982 132 of the 443 enterprises of the manufacturing industry increased the share of capitalist markets within their total exports. In view of increasing the orientation to the capitalist markets a favourable picture was shown by the engineering industry. The degree of extending the share was of course not equal for all the enterprises. In more than two-thirds of those increasing the share of their capitalist export markets the growth was less than 20 percent, and a quarter of them achieved an increase between 20–25 percent. The development was most dynamic in the engineering industry.

In spite of the goals set by economic policy, in almost a third of the manufacturing

companies the changes in the examined period meant a decline in the share of the capitalist markets. In their orientation towards capitalist markets the building materials and the chemical industry were the most unsuccessful.

Interdependence between the Main Factors of Changes in the Export Markets

We investigated the trends of market changes in the function of several factors. Here we emphasize two correlations which we are going to discuss in more detail: we shall evaluate the changes on the one hand from the aspect of the extent of exports to capitalist markets, and on the other, from that of profitability.

The Relationship between Market Changes and the Extent of Exports to Capitalist Markets

By studying the changes as function of the extent of exports to capitalist markets it could be found that changing the markets was most characteristic of those enterprises which perform medium-size (Ft 50–500 million) exports to capitalist markets; these are the most flexible. In the companies having very small or very high quantities of such exports this activity belongs to the marginal ones, so they lay no special stress on increasing their exports to capitalist markets. Presumably their poor apparatus in the foreign markets also hinders them in doing so. It is probable that in the case of such enterprises the opportunity to change could be created by a better marketing and business policy, exploring and utilizing the gaps in the market. It is still a general feature of Hungarian economic management and economic regulation that they are mostly concentrating on volumes and – despite the positive examples of capitalist practice, – are unfortunately rather not concerned about "small items". As we see, the situation is different with the enterprises transacting large volumes of exports to capitalist countries. Here the orientation to capitalist markets is relatively high. But it rests usually on traditional relations, or in some cases on inter-governmental agreements, therefore they have a narrower sphere of motion in their policy of directing the trade by markets.

The correlation appearing between the changes in the volume of the exports to capitalist markets and in the share of them in total exports is also noteworthy. According to our survey's results, of the 132 enterprises which increased the ratio of exports to capitalist countries, 119 achieved this with an increasing volume of such exports, and only 13 were found where parallel to a growing ratio the volume declined.

Several enterprises were found where, even for maintaining the ratio of the capitalist markets, the exports directed to them had to be increased, while with 27 enterprises despite increasing their volume, the ratio of exports to capitalist markets decreased within the total exports. The trends of price formation were currently omitted. According to the information given by the enterprises, throughout the analysed period no significant price changes occurred.

The Relationship between Market Changes and Profitability of the Exports to Capitalist Markets

When investigating the results attained by export activities in capitalist markets their profitability cannot be immaterial. This subject has recently come to the foreground of the experts' interest. We wish only to indicate what trends of export profitability accompanied the changes that emerged in the period 1978–1982.

We have determined the profitability of exports to capitalist markets by indicators showing the cost of earning foreign currency on the level of the production costs of the commodities. The enterprises increasing the ratio of exports to capitalist markets within the total of exports were classified by the calculated indicators. Taking into account that in 1982 the average rate of exchange of the dollar fluctuated between 34.4 – 39.4 Ft/\$ we considered the enterprises showing an indicator below 35 Ft/\$ as having good export profitability, those where the indicator was between 35–40 Ft/\$ as medium ones and the enterprises which earned a \$ by more than Ft 40 as those with poor profitability. Though this classification may be qualified as rather severe, it must provoke consideration that not more than two-fifths of the enterprises have shown good profitability. This demonstrates that, in order to meet the central intentions, or, owing to some other reasons the views of profitability were often pushed to the background. The profitability of exports is less favourable in the enterprises largely oriented to capitalist markets, i.e., large exports to capitalist countries are not accompanied by higher economic efficiency. This seems to underline the finding of many who stated that there is an inverse correlation between the volume and profitability of exports; with growing volume profitability declines. This follows from the low efficiency of the enterprises. The regulation system is unable to bridge this, foreign currency must often be earned by uneconomic means.

A positive correlation has shown up between the ratio of exports to capitalist markets within total exports and profitability; this means that profitability is an unequivocal motivation to increase that ratio. Namely, the enterprises which increased the share of exports to capitalist countries transacted to a large extent (over 50 percent) the export with good profitability at a higher than average rate.

For the purpose of deeper analysis of the relationship between profitability of exports to capitalist markets and its proportion within total exports we determined, by enterprises, the increase of exports falling to a unit of the increasing ratio of the export to capitalist markets.³ The indicator shows the change of total value of exports resulting from 1 percent growth in the ratio of exports to capitalist markets. This is also a yardstick of correct policy of market orientation, showing whether the changing proportions of markets contributed to the increase of returns from exports. The objective is, of course, — as was mentioned above — to increase not merely the exports but the value of profitable exports. Only 61 were found among the 132 enterprises

where — E_0 = total exports,
— E_t = exports to capitalist markets

**The changing ratio of the exports to capitalist markets
of the manufacturing industrial enterprises,
in function of export profitability in 1982^a**

Extent of growth in exports to capitalist markets	Low (20)	Medium (20–50) percent	High (over 50)	Total
Economic efficiency of exports to capitalist markets	growth or export ratio to capitalist markets			
Poor	25	8	1	34
Medium	25	5	1	31
Good	32	17	7	56
No data available	8	1	2	11
Total	90	31	11	132

^aComputations by the author

increasing the share of exports to capitalist markets where the calculation resulted in the indicator $r > 1$, i.e., where the market changes entailed the growth of total exports. It is only natural that the development of the returns from exports is influenced by a great number of factors and directing the exports towards certain markets is only one of them. In our opinion such a – perhaps new – approach may, by all means, be instructive.

The picture outlined on the basis of reviewing the orientation of the manufacturing industry to capitalist export markets shows that though it can be sensed that in the external market activities of the enterprises positive changes have taken place, adjustment to foreign markets is still not a vital interest to them. Despite the various resolutions, statements, requirements formulated by the national economy, 60 percent of the enterprises of the manufacturing industry (the exports of which accounted for 67 percent of total exports in 1982) did not increase their export share to capitalist markets. What is more, in one third of them the ratio of exports to capitalist markets declined within the total. In addition to the fact that the enterprises were unable to increase the volume of exports to capitalist markets simultaneously with meeting the requirement of profitability meant a serious problem. There are a number of reasons why the enterprises could not fulfil the requirements raised so far. The most important of these may be that still no sufficiently effective incentive exists prompting the enterprises to profitable exports to capitalist markets. Several surveys have indicated that the profitability of the large exporters usually lies behind that of the other enterprises of the same branch. Looking at it from another aspect, the low degree of exportability reflects the lack of *international competitiveness*. For the purpose of

export oriented development of the manufacturing industry in the future any possible means have to be resorted to by the enterprises. Our aim furthered by our research work was to call attention to the high necessity of extending the arsenal of means.

DISTRIBUTION CHANNELS OF THE HUNGARIAN MANUFACTURING INDUSTRY

MÁRTA KIEFER

The products of the Hungarian manufacturing industry reach the consumer through several channels. According to the experience gained by our survey, a large number of directing, regulating and interest-creating factors exist and act in practice which significantly restrict the possibility to develop more differentiated distribution channels. Today the majority of the products reach both the domestic and foreign consumer through channels longer and more articulated than necessary.

Unilateral Channels of Domestic Sales and Exports

It is proven by domestic and foreign theoretical surveys and practical experience that means of production, durable and non-durable consumer goods require distribution channels differing in length and articulation (1,2,8). In knowledge of this it is justified to presume that in the Hungarian manufacturing industry – where all of the three product groups represent significant shares – the distribution channels are appropriately structured. However, the analysis of the statistical data as well as the results of our survey, conducted in 12 enterprises by questionnaires, convinced us in many respects of the improper articulation of the channels in the domestic and foreign sales and the serious lack of differentiation required by the various groups of products. This is indicated first of all by the fact that in the domestic sales of the industrial companies the direct sales to the population and to retail shops amounted to only very small shares in all of the industrial branches. Beyond this, the predominance of direct turnover in industry and other sectors as well as of the sales to wholesaling organizations is conspicuous (*Table 1*). We deem this to be a problem mainly in such branches – e. g. in the light industry – where most of the output consists of consumer goods which would require shorter channels of selling, i.e., a larger share of selling directly to the population and to retailing organizations.

Improper vertical articulation of the distribution channels, as well as the predominance – often entirely in contrast to the requirements of the products – of some definite type of a particular commercial partner, are a frequent characteristics found in the exports of the industrial enterprises, too. First of all, the ample role played by the foreign trade companies has to be mentioned as a general phenomenon (*Table 2*). This applies especially to the building materials, the chemical, the engineering and the light industry. In the latter two branches the equipment for production and consumer goods which would require much more direct contacts with the users

The distribution of sales channels of the manufacturing industry in 1982 by main branches of industry in 1982 (in percent)^a

Main branches of industry	Distribution of sales by channels, in percent					
	Whole-sales trade	Retail trade	Direct sales to population	Direct sales to industry	Other channels ^c	Total sales
Engineering industry	10.6	3.9	1.7	38.3	45.5	100
Building materials industry	7.2	27.1	0.7	22.7	42.3	100
Chemical industry	7.9	2.2	1.3	25.2	63.4	100
Light industry	35.9	9.8	0.7	31.7	21.9	100
Food industry	24.2	42.2	1.4	20.9	11.3	100
Manufacturing industry, total ^b	14.5	12.5	1.8	36.6	34.6	100

^a At domestic selling prices of own production – on the basis of internal records of the Central Statistical Office.

^b Including metallurgy.

^c Total sales to agriculture, communication, services, etc.

and consumers, represent a considerable ratio. The foreign trade companies, in an opposite way, lengthen this route by increasing the number of steps between the producer and the consumer. Therefore, in the case of several products, it would be more expedient to extend the rights to transact direct exports, of course, under the condition that the industrial enterprises improve their marketing activities appropriately to an up-to-date level. Here we think, within the engineering industry, mainly of the equipment of communication and vacuum technology, instruments, various machines and mechanical equipment. In these branches of manufacturing the share of the exports transacted through foreign trading companies is especially high.

Within the sphere of the light industry the role of the foreign trade companies is somewhat more differentiated. While e.g. in the products of the cotton, knitwear and the silk industry, postulating shorter distribution channels, the exports transacted through foreign trade companies amounts to almost hundred percent, in several other

Table 2

Exports of the manufacturing industry in 1982 distributed to direct exports and exports transacted through foreign trade companies, by main branches of industry (in percent)^a

Main branches of industry	Distribution and dynamics of exports by sales channels (percent)		
	Direct exports	Exports through foreign trade companies	Total exports
Engineering industry	18.4	81.6	100.0
Building materials industry	5.2	94.8	100.0
Chemical industry	11.4	88.6	100.0
Light industry	20.9	79.1	100.0
Food industry	26.0	74.0	100.0
Manufacturing industry, total ^b	19.8	80.2	100.0

^a At domestic selling prices of own production – on the basis of internal records of the Central Office.

^b Including metallurgy.

fields – e.g. in the manufacture of furniture and other products of the woodworking industry – the licences of direct exportation represent a much higher share.¹

The Different Structures of the Purchasing and the Selling Markets of the Enterprises

Although the right to transact their exports directly and several other factors have recently increased the possibility for the enterprises to select appropriate trading partners, still there are several circumstances which hinder the industrial enterprises in doing so.

According to our experience, the fact that in several cases the structure of the enterprises is different from that of markets of sales and purchase, delimits their

¹ Up to 1968 the Hungarian industrial enterprises were restricted to export their products exclusively through the foreign trade companies. Thus, they had only indirect contacts with the foreign users and consumers. Currently the situation is different. After 1968 a part of the industrial companies received the right to transact their own exports and so they could make direct contacts with their foreign partners, by leaving out the foreign trade companies.

possibilities to select developing distribution channels that suite the various types of markets and commodities more appropriately.

Our survey has shown that the oligopolistic or atomized character of their purchasing market made it difficult for the enterprises to meet the demands of a monopolistic selling market. We have found the same with industrial enterprises investigated, where the factories had to buy the components and semifinished products generally from a large number of enterprises, whereas sales were effected only through a few wholesale and one or two foreign trade companies. Strong monopoly character of the selling market in itself restricts the enterprise's possibilities of selection and, in our experience, this is only aggravated by the atomized purchasing channels – which are anyway difficult to treat, owing to the various problems of cooperation, etc. The tension caused hereby may be increased at the same time by the fact that even this atomized purchasing market consists often of producers who in respect of the given components, etc., are in monopoly position, hence the possibilities of selection have been further restricted for the surveyed enterprises.

The differing structure of the purchasing and selling markets is a characteristic feature not only in one type of enterprises, e.g. the industrial enterprises. Differences can also be found depending on the kind (function) of the enterprise dealt with. The differences between the purchasing and selling market have varying features with each of the industrial, internal trading, or foreign trading companies. In the case of the enterprises of domestic trade, the structure of the purchasing market is – in opposition to industry – mostly monopolistic, while the selling market is atomized or oligopolistic. Similar findings were also experienced in respect of the exports paid in convertible currencies of the foreign trade companies.

The monopoly character of the purchasing market of internal and foreign trading companies often follows from the autocratic position of the industrial enterprises – especially in the case of import restrictions.² This can be seen from our finding that in the case of six out of the twelve enterprises surveyed the primary view in selecting the purchase channel was that the product was a monopoly commodity and could be bought only from a given enterprise. In knowledge of this it is not surprising that, in the fulfilment of the delivery contracts of the internal trade enterprises, shortfalls are experienced almost without any exception. In most cases the industrial enterprises accepted lower quantities than were demanded by the internal trade companies already when concluding the contracts. Considerable underfulfilment can be seen at the same time between the orders accepted in the contracts and the actual deliveries.

Stronger "Seller's" and Weaker "Buyer's" Position

Owing to the different characters of the purchasing and selling markets, the position of an enterprise considerably varies depending on whether it participates in trading as a seller or a buyer. In general its position as a buyer is usually less favourable, owing

²The sphere of products subject to import restriction in Hungary increased especially in the past years – as a result of economic recession.

to the monopoly character of the supply. As a seller, however, it usually enjoys superiority, among other things because of the atomized or oligopolistic demand.

The superiority of the seller's position is reflected by the distribution of the turnover based on contracts of the internal trading enterprises by types of contracts, or, resp., the differences linked to them, depending on whether a buying or selling contract is concerned. In purchasing, annual delivery contracts are predominant with the internal trading enterprises, while in selling quarterly contracts play a greater part.

The stronger position of selling is also indicated by the experience gained through the research into the contacts between industry and the foreign trade companies. In the relationships with the foreign trade companies the interests of industry are asserted especially in the cases of large industrial enterprises in monopoly position. The reasons why some important offers of the investigated foreign trade companies failed, allow for this conclusion. It is conspicuous that in the analysed years the failure of tenders was in all foreign trade companies due to the high prices quoted. To understand this it must be known that the foreign trade enterprises are still interested in selling as large quantities as possible. (The commission contracts applied in broad spheres stimulate them in this direction, but, according to recent experience, even the increasingly spreading agreements of the pool type, or joint ventures do not eliminate this entirely.) The industrial enterprises are, on the contrary, interested in setting the offered prices as high as possible. They are prompted to do so by the continuously growing costs of raw materials, etc., the pressure to make exports profitable, the "constraint" to increase the income in convertible currencies, and so on. And, in our experience, a further factor also acts to this effect, namely, the missing information about the position of their products in the market, more precisely, *the differing opinion of industry and foreign trade* in this respect. We have, in several cases, found considerable differences between the value judgement of industrial and foreign trade companies regarding the characteristics of both the markets and the products. The differences are most conspicuous in respect of standards of technology and the equipment working in production. While the foreign trade companies deemed the quality, marketability, or serviceability of the products to be on average level – mainly from the view of the markets, – some of the industrial enterprises were convinced of their high level in all these respects.

High Ratio of Centralized Decisions – Outdated Marketing Organization

Pursuant to our experience the selection possibilities of the producers – regarding changes of the distribution channels – are further restricted by the fact that in both the domestic and foreign trade enterprises the proportion of centralized decisions is too high. The leaders, in general, reserve too many decisions for themselves and this circumstance – especially in the case of large organizations – often questions their correctness. (The larger an organization, the more difficult it is for one person to comprehend a number of issues in their entire depth.)

Very likely the wish to resolve this problem contributed to the fact that in the

operative activities of the trading enterprises a verticality of five steps had been developed: sales clerks – head of section – head of department – sales manager – general manager. At the same time in the fulfilment of several tasks both the trading and the functional departments take part. At first sight these vertical transmissions seem to mitigate the disadvantages stemming from the great number of centralized decisions but practical experience shows that this is not at all as unequivocal as that. To make a decision and implement it often takes an unduely long time. A good example of this is the work of the foreign trade enterprises in tendering their offers. Our experience proves that in 1982 the preparation of the offers, even those most important for the firms, took 12 – 20 days – depending on the type of product – instead of the 4-5 days necessary according to the opinion of their experts.

There are many who think that the existing problems call for an urgent reduction of the vertical articulation. In our opinion, however, the difficulties are caused not only by the number of steps and the following slow decision process, but also by the cumbersome business administration that follows the decision.

Owing just to these circumstances, it would also be necessary to decentralize some of the decisions and this could be facilitated by a certain reorganization, too. Namely, the current commercial enterprise organizations, built partly on marketing and partly on functional departments, do not promote the decentralization of decisions. Our idea is on the one hand to create *teams* which would integrate the business transactions, including market research, correspondence and forwarding formalities (within these, one person could manage several tasks, specialized e.g. to certain products). On the other hand, the activities requiring special knowledge, – finances, foreign exchange, shipping, insurance, accounting, etc. – might remain centralized further on. Where such modification of the internal organization of the trading companies could be introduced, it would be possible to decentralize a part of the decisions and to make adjustment more flexible. Last but not least it is also an important point that the possibilities of the industrial enterprises in choosing their trading partners could be extended.

Shifts between the Phases of Specialization and Diversification of the Wholesaling and the Retail Trading Enterprises

The experiences of our survey made us to conclude that a relatively strong wholesaling concentration of the products of the industrial enterprises and the eventual efforts of modification linked to this are strongly restricted as yet by the fact that a considerable phase shift can be seen between the specialization and diversification of the wholesaling and retailing companies.

As mentioned in the preceding chapter, the special lines of the internal trading companies had been developed essentially on the basis of distribution of products in industry. But while in wholesale trade this can be considered characteristic even today, the lines of commodities in retail trade have considerably changed in the past ten years. *Some networks of shops selling a broad scale of commodities have come into being, – retail trade became diversified. Simultaneously, however, specialized*

commercial units, selling only a few related types of commodities, *have also subsisted*. This process shows that — if with a delay of a few years — changing the commodity lines in retail trade followed in many respects the diversification and specialization which took place in the network of retail trade of the advanced capitalist countries.

However, the phase shift that occurred between the commodity range of the wholesale and that of the retail trading companies caused increasing problems for the retail shops and the consumers. For instance, the purchasing problems of the shops which sell a broad spectrum of commodities are multiplied by the fact that it is not possible to contact one or two wholesale enterprises engaged in selling the broad scale of products in harmony with those marketed by the retailing enterprises. In our experience the result is that these firms have to keep contacts with 50-70 companies in order to provide the choice of products according to the lines of their sales.

Even the specialized retail shops are not in a better position, merely the character of their problems is different. Although in principle the specialized nature of wholesale trade would entail smooth purchasing, in adequate assortment, by the specialized retail and intermediary trading companies, the monopoly position of the former makes this not always possible. Namely, in the opinion of practising experts — owing, among other things, to the lack of interest that is due to their monopoly position, — a complete selection of the product groups in question is often not available.

In our experience this is one of the decisive reasons why the assortment of the shops in type and quantity often differs considerably from those ordered or from the supply of the factories. This disharmony also contributes to the claim of the retail trade for the permission to place their orders directly with the producers. This claim remains mostly unfulfilled, because of the above mentioned more favourable position of the wholesale trade.

The shift between the specialization and diversification of wholesale and retail trade, beside causing troubles in meeting the demand of the customers, also puts a brake on the modernization of the marketing channels of the industrial enterprises. It stabilizes the current situation, i.e., the high ratio of wholesale trade and the secondary role of the retail enterprises in the sales to the consumers. All this strongly hinders the development of more differentiated channels for the industrial enterprises for marketing their products.

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