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TITLE: INDUSTRIAL POLICY IN EASTERN EUROPE
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EXECUTIVE SUMMARY

We have examined the industrial policies of six East European countries -- Bulgaria, Czechoslovakia, the German Democratic Republic, Hungary, Poland and Romania -- during the post-World War II period. Although each of these countries employs central planning to allocate resources and has a general strategy of pursuing industrialization, we identify in each country distinct elements of an industrial policy. Among these elements are a conscious realization that certain sectors of industry are of particular significance as carriers of technological progress, as sources of international competitiveness, etc. Moreover, the choice of which sector to promote is made with a view of which foreign market is to be served. Some countries, such as Bulgaria and Czechoslovakia, chose priority sectors on the basis of the needs of the Soviet or the CMEA market. Others, such as Poland, viewed the world market as a reference. Despite the existence of central planning, all countries have adopted extra-plan mechanisms for providing special assistance to priority sectors, including special investment and R&D funding, priority access to labor, changes in the organization of industry, and reform of the planning mechanism to facilitate the flow of resources to priority industries.

We find that, while there have been setbacks in the effort to identify and nurture leading sectors of industry, there have also been successes. Overall those countries that developed industries with a view toward serving the Soviet or CMEA markets have been
more successful in achieving exports from targeted industries than have those countries that have sought to compete on world markets. Moreover, industrial policy in East Europe has both strengthened and benefited from CMEA specialization and integration.
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INTRODUCTION

This report examines the formulation and implementation of industrial policy in six East European countries, Bulgaria, Czechoslovakia, the German Democratic Republic, Hungary, Poland and Romania. We both summarize our findings and provide a review of the content of articles and research papers written by us during the course of our research. A bibliography of these papers is attached. Industrial policy is taken to mean something more specific and at the same time broader than structural policy. The latter may be viewed as planners’ choices about the relative growth rates of various sectors of industry. While industrial policy also implies choices about the rate of expansion or contraction of various economic activities, it attempts to provide a rationale for making such choices by evaluating the ability of individual sectors to promote specific objectives. Among these objectives are domestic growth, export competitiveness, energy and raw materials utilization and the performance of down-stream or consuming sectors. Industrial policy also differs from planners’ expressions of preferences about structural change because industrial policy involves the creation of new, often extra-plan, mechanisms for promoting the development of priority sectors, for allocating resources to them and for linking them to international markets.

Pressure on the East European countries to formulate and implement effective industrial policies intensified sharply in the 1970s and continued unabated in the 1980s. The slowdown in economic growth brought about by the exhaustion of the so-called
extensive factors of growth and the general unwillingness to implement meaningful economic reforms during this time left industrial policy as one of the few attractive alternatives for attaining sustained growth. On the international front, a number of factors induced East European policy makers to focus on industrial policy. Not the least of these international developments was the continuing success of the Japanese economy, attributed by many observers to that country's implementation of a comprehensive industrial policy. Secondly there was a desire to take advantage of the so-called scientific-technical revolution and to close the technological gap between the East and the West. This was particularly important for the export industries in these countries, since these industries were facing increased competition on western markets from the newly industrializing countries and on the CMEA market from the exports of Western Europe, the United States and Japan. The increase in energy and raw material prices created a need to promote new, less energy and material intensive industries while dealing with the contraction or reinvigoration of those that were rendered uncompetitive on world markets or uneconomic due to their excessive consumption of imported inputs.

In the first half of the 1970s, international forces tended to facilitate the implementation of industrial policy. The easing of tensions between East and West facilitated the flow of equipment and technology from the latter to the former while the build-up of deposits in western banks provided the wherewithal to
finance such imports. In the latter part of the decade and in the first half of the 1980s the situation was reversed. Credits to East Europe dried up and, as the East European countries sought to reduce their debts, imports of technology and equipment were sharply reduced. At the same time, the need to run balance of payments surpluses reduced the availability of domestically produced investment goods, further complicating the carrying out of industrial policy by reducing the volume of resources that could be devoted to its implementation, thus forcing ever more difficult choices on planners.

It is not surprising that within this complex environment the policies adopted by the six countries studied in this chapter, varied as they are in terms of level of development, quality of decisionmaking, economic system and national aspirations, should differ in terms of sectors selected for promotion, of means adopted for allocating resources to these sectors, and in the ultimate success of their efforts. The next section sets out the bases of industrial policy and develops an analytical framework within which the industrial policies of the East European economies can be compared and evaluated. The policies themselves are set out in the following section. Next, we examine and analyze the available evidence on structural change in the sample countries. The report then closes with some conclusions on industrial policy in East Europe. To this tour d'horizon we must add a caveat. Although the plan of attack is comparative, there are inherent limitations. Some of these limitations stem from
inter-country differences in the quality of published economic discourse on the subject and also from differences in the conceptualization of the questions surrounding industrial policy. Similarly, the quantitative analysis of industrial policy is hampered by differences in the amount of data available regarding the industrial structure of each country. Despite these limitations, a comparative overview of industrial policy in all the East European countries is critical to the understanding of the changing industrial structure in East Europe and of the evolving trade relations within CMEA as well as between CMEA and the rest of the world.
AN ECONOMIC BASIS FOR INDUSTRIAL POLICY

The objective of industrial policy is to improve economic performance by favoring, either directly or indirectly, certain sectors of the economy. The sectors thus favored are expected to grow more rapidly or decline more slowly than they would without aid. The improvement in economic performance, whether judged by aggregate growth, export growth or import substitution, productivity, or employment, thus results from the fact that the favored sectors are larger than they otherwise would be.

VARIETIES OF INDUSTRIAL POLICY

The promotion of favored sectors of the economy can be achieved in a number of ways. The broadest conception of industrial policy is one that is economy-wide and that seeks to improve the functioning of the economic mechanism. In market economies such policies would eliminate market imperfections by dismantling trade barriers, improving the working of the capital market, promoting labor mobility and fostering competition to the advantage of dynamic sectors whose growth could be promoted by the

more efficient operation of markets. In planned economies, economic reform plays an analogous role. To the extent that shortcomings in the system of economic management impede the transfer of resources to potentially dynamic sectors or fail to stimulate the rapid adoption of new products and technologies, the system may be viewed as a barrier to the growth of the most promising sectors of the economy. Reforms, whether centralizing or decentralizing, that improve the system's functioning in these areas are thus also a form of industrial policy.

A somewhat more specific form of support for favored sectors is one that promotes activities that are thought to especially favor these sectors. Among such policies are support for research and development activities or increased state activity in the field of research. Since new sectors are often viewed as technology based, the presumption is that a greater volume of research and development activity will be particularly favorable to their growth. Efforts to increase the volume of investment are another means of promoting emerging sectors by making the needed inputs more readily available. Forming pools of "venture" capital that are earmarked for priority sectors supplement such efforts by directing a larger share of total investment to emerging sectors. Governments also dispose of a wide variety of policies in the area of human resources: training programs for workers, efforts to increase labor mobility, and the availability of various types of education. Finally, the creation of infrastructure thought favorable to the emergence of priority sectors also falls into
this category of industrial policy.

More focused industrial policies are those that seek to assist specific industries or sectors of industries directly. Such policies may involve fiscal assistance, trade policy assistance, better access to inputs and the creation of infrastructure by the government. Efforts to promote mergers, to limit competition among firms in the sector, and to provide for controlled access to foreign technology are all used to promote sectoral growth. In the countries discussed in this paper, the need to achieve economies of scale may imply that policies aimed at the promotion of a sector effectively imply the support of an individual enterprise, since it may either completely dominate its domestic competitors or have none. Such emphasis on firm-specific sources of comparative advantage has found theoretical support in the work of Krugman (1980).

THE NEED FOR INDUSTRIAL POLICIES IN CENTRALLY PLANNED ECONOMIES

The argument for the use of industrial policy in market economies rests largely on the existence of market imperfections that create differences between private and social costs and benefits. Among the more germane ones are economies of scale, whether at the firm or sectoral, assembly or component production level. Other non-convexities in production include learning by doing and specific-firm advantages resulting from size, past research and experience. There are also imperfections in labor
markets such as the under-provision of general human capital by firms to workers, or the destruction of firm-specific human capital in declining sectors. Similarly, proponents of industrial policy point to imperfections in capital markets that may favor established firms over nascent ones.

There may also be imperfections in output markets. One of these is that the social benefits (or spillovers) from the output of one sector are not reflected in the price that consumers of the sector's product pay. Computers, for example, are a product believed to be important to the efficiency of other industries and to the ability of entire economies to remain competitive and contemporary on a global basis. Second, there may be possibilities for creating market imperfections by gaining a monopolistic or oligopolistic market position, possibly through the strategic anticipation of the workings of the international product-life cycle.

The industrial policy of the planned economy can be conceived of in two ways. First, since economic activity is planned, the state has a de facto industrial policy that operates at all levels from that of the economy down to the level of the industry and indeed the enterprise. In such a conception of industrial policy, which equates industrial policy with structural policy, non-convexities that cause market imperfections in market economies may also exist, but they do not cause any difficulties under socialism. Consequently there should be no need to introduce industrial policy measures beyond the economic plan.
itself. Such a view rests on the belief that planners are sufficiently aware of convexities and can construct a plan that takes them into account. It also assumes that there is nothing in the nature of the economic mechanism that hampers the implementation of the plan or that whatever elements do hamper the implementation of the plan do not hamper disproportionally those activities related to structural change and innovation. If these conditions are met, then the structural aspects of plans would represent the entirety of industrial policy in a planned economy.

Evidence abounds that these assumptions are not valid. Enterprises are unwilling to make use of new technology; difficulties in the vertical coordination of production preclude the creation of economies of scale and specialization; vested labor, regional and industrial ministry interests hamper the movement of factors of production from one industry to another. All these are well known phenomena in planned economies, and, even if one were to grant planners sufficient information to formulate an optimal structural policy, it is evident that there are important forces at work impeding the implementation of the structure-determining aspects of the plan.

There is also indirect evidence of these barriers. That is, there exists in many planned economies an industrial policy that supplements the plan and the mechanisms that are employed to promote plan implementation. Among the measures used to aid in the implementation of industrial policy outside the normal mechanisms are organizational changes, priority access to labor,
capital and imported inputs and subsidization of production and research (Brada and Montias, 1984, 1985). Thus it is important to recognize that industrial policy in East Europe operates both at the level of the plan and at the level of semi-autonomous policies and allocation mechanisms that operate outside the plan and the existing economic mechanism.

COMPONENTS OF INDUSTRIAL POLICY

A useful way of viewing industrial policy in a comparative setting is to decompose it into the four following elements:

Selecting Industries for Expansion or Shrinkage. As discussed in the previous section, there are some economic bases for industrial policy in the planned economy; to these it is necessary to add political ones. Moreover, the economic reasons for choosing sectors for promotion are somewhat subjective, so that the optimism of policymakers is given greater leeway than in other areas of economic policy. Thus an effective industrial policy is one that makes realistic assessments of the possibilities of achieving economies of scale, advantages in imperfect product markets and firm-specific competitive strengths. Similarly governments must be willing to apply similar criteria to sectors that no longer appear to be competitive and are in need either of support or elimination.

Selecting Markets. In selecting the industries that are to receive government support, the characteristics of the production
process are of course important. The government must seek out industries where productivity and productivity growth are high, where economies of scale will create the potential to preempt rivals from other nations, etc. However, the demand side characteristics of these industries are just as important. That is, the income elasticity of new products ought to be high as should the price elasticity of market share of established products. Industries aimed at the leading edge of the product-life-cycle in advanced economies will benefit from longer lives than industries geared to older products, since, as advanced-country markets become saturated, the markets for these products in less developed countries begin to expand.

In the case of Japan, for example, the post-War decision to promote capital-intensive industries was as much influenced by their appealing supply-side characteristics as by the realization that, at the time decisions on industrial policy were made, the United States was the only large market open to Japanese exports. The Japanese predilection toward high productivity-growth sectors was reinforced by the need to serve a large, sophisticated market with high income elasticity of demand for goods produced under conditions of increasing returns to scale or by industries characterized by relatively uncompetitive price policies.

Allocating Resources. Even if the government is able to identify winners and losers, it faces the problem of reallocating resources from the latter to the former. Existing industries have a vested interest in remaining in existence and both management
and labor are likely to exert strong pressure to turn industrial policy into a policy of protecting declining industries. Similarly, representatives of industries viewing themselves as potential winners are likely to pressure government decision makers to make allocations favorable to them. Since established sectors are likely to have greater political leverage than nascent or non-existent ones, the possibilities for developing new industries would appear to be limited. Moreover, given the political demands of many labor and management advocates from different sectors, the government may be forced to spread the access to additional capital and labor among too many industries, thus precluding the possibilities of capturing economies of scale.

Generating Production and Exports. To the extent that the government is able to direct resources toward favored sectors the possibility of a successful industrial policy exists. The achievement of success will depend on effective production, so that economies of scale and potential productivity gains are realized. This requires appropriate management skills as well as the ability to create the necessary technology or to master technology imported from abroad. Once produced, goods must be marketed effectively in the target countries.
A SURVEY OF COUNTRY POLICIES

Bulgaria

Of the CMEA countries, Bulgaria has been the most consistent in the choice of sectors selected for preferential treatment and has maintained the clearest relationship between the demands of its target markets and the choice of priority sectors. At the same time, Bulgaria’s industrial policy more nearly resembles a structural policy in that for much of the period under review there appeared to be no extraordinary changes in economic system, organization and incentives to favor priority sectors’ access to resources. In part this may be due to Bulgaria’s relatively low level of development which facilitated the expansion of priority industries through the central allocation of new resources rather than through the reallocation of existing ones.

Although Bulgaria’s priority sectors, metallurgy, machine building, electronics and chemicals do not appear to differ much from the traditional conception of a socialist development strategy, Bulgaria has succeeded in developing narrower specializations in several of these sectors that have enabled it to achieve economies of scale, firm-specific advantages and the ability to apply new technologies with a higher pay-off in terms of trade performance than achieved by other socialist countries.

The least successful object of Bulgarian industrial policy has been metallurgy. With Soviet assistance two large steel

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2An extensive treatment of Bulgarian industrial policy is contained in J. Michael Montias, "Industrial Policy and Foreign Trade in Bulgaria, 1960-1980."
making complexes were constructed; the Lenin works in Pernik, and in the 1960s, the Kremikovitsi works outside Sofia. The latter complex was constructed in the expectation of the development of local ore deposits which failed to materialize, forcing the complex to rely on imports of both enriched ores and coking coal from the Soviet Union. Due to high transportation costs for these inputs within Bulgaria, the complex has not been profitable and as a consequence appears not to have operated at full capacity in the 1970s (Lampe, 1986, pp.167-8). Like steel firms in many other countries, Kremikovitsi has received government support for its operations and has been permitted to pay above-norm wages in order to retain its workforce. In the 1970s, the government injected fresh funds into the complex so as to increase its capacity for working the steel produced into pipes, rod, etc., (Jackson, 1981, p. 610). At the same time, a new steel complex is being constructed near Burgas on the Black Sea coast. While the new mill's location should make it less costly to operate with imported inputs, metallurgy cannot be regarded as a successful object of industrial policy on the basis of dynamism or contribution to export competitiveness.

Machinery has been a much more dynamic and successful example of the promotion of sectors for both structure-determining and export purposes. Indeed, Bulgaria ranks only behind Czechoslovakia and the GDR in the share of machinery in total exports. During the 1970s machinery's share in exports increased from 30 to 50 percent and by 1985 had reached 56 percent. Given Bulgaria's relatively high export to NMP ratio, this suggests that
a large part of Bulgarian machinery production is intended for export markets. The centerpiece of this export-oriented machinery sector is Balkancar which, with 45,000 employees, accounts for 20 percent of Bulgarian industrial output making it the largest industrial enterprise in Bulgaria (Lampe, 1986, p. 176). Balkancar is most famous for its fork lift trucks of which it is the world's largest producer, but it also produces a wide range of other material handling equipment. About three-fourths of Balkancar's production is exported, mainly to the Soviet Union and to the other CMEA countries. Given the scale of production and Balkancar's experience and reputation it seems reasonable to attribute its success not only to economies of scale, but also to firm specific advantages of name-recognition and learning-by-doing. Some of Balkancar's competitive position must also be attributed to Bulgaria's efforts to prevent the development of competitors within CMEA by appealing to CMEA specialization principles and by lobbying against import-competing investments in forklift truck production within CMEA. Lampe (1986, p. 176) reports that the Bulgarians persuaded the Soviet Union not to carry out a plan to construct a large plant for the manufacture of fork-lift trucks in the USSR. Bulgaria also appears to have been successful in developing the production of metal-working machinery, trucks, buses, ships and agricultural machinery, often either on the basis of CMEA specialization agreements or of bilateral agreements with the Soviet Union. The latter have been particularly important for the expansion of the production and export of components for Soviet enterprises, for example for the
production of automobiles and computers in the Soviet Union. As a result, in 1981 37 percent of Bulgarian machinery exports were covered by CMEA specialization agreements, while the Soviet Union imported about three-fourths of these.

Another successful area of emphasis has been in electronics, especially in computers. The latter are viewed as important for structure-determining reasons, being viewed as important for the development of other high technology activities such as the manufacture of robots as well as for the management of industrial operations and agro-industrial complexes. Like machinery, electronics have also been a dynamic component of exports, largely to CMEA, with the Soviet Union the main buyer. Bulgaria accounts for about 40 percent of the CMEA's output of microcomputers and Bulgarian diskettes and personal computers appear to be relatively well received in other CMEA markets.

In the late 1960s and early 1970s Bulgaria, like many other CMEA countries also gave priority to the chemical industry largely due to its structure-determining characteristics. Until the mid-1970s both production and exports grew rapidly. However, in the face of world-wide over-capacity in the petrochemical industry and the limitation on the supply of Soviet oil that represented the feed stock for the Bulgarian chemical industry, this sector has languished since the mid-1970s (Jackson, 1986a).

While the organization of Bulgarian industry and reforms of the planning system have generally followed East European trends, including the formation of associations and the declining emphasis on physical indicators, there is little evidence in Bulgarian
writings that such measures had any specific elements intended to facilitate the promotion of priority sectors. The reform measures announced in 1986, on the other hand, do have the specific intention of promoting the effective and speedy application of scientific breakthroughs to industry. The reform measures create three super-ministries, one of which deals with the economy and thus controls all industry, hopefully eliminating some of the autarchic tendencies of individual industrial ministries. Such a super-ministry should be able to shift resources from one sector to another to promote the growth of priority sectors, especially in view of the simultaneous downgrading of the State Planning Committee. Another Bulgarian institutional innovation for promoting technological progress is support for small or out-of-plan enterprises. Through the Bulgarian Industrial Association units of enterprises can obtain funds and resources to support proposals for productive activities outside the plan. The objective is to introduce an element of flexibility into the allocation of resources, particularly to promote the adoption of advanced technology and to promote hard-currency exports.

Czechoslovakia

In Czechoslovakia, a declining growth rate, the exhaustion of labor reserves and deteriorating international competitiveness made the development of an industrial policy of critical importance, particularly because there was no possibility of an
economy-wide reform after 1968. Moreover, unlike Bulgaria, Czechoslovakia was an industrialized economy and therefore industrial policy had to be more focused than the more general industrialization drive in Bulgaria.

An explicit industrial policy was first formulated for the fifth FYP, 1970-75. The objectives of this policy were to "concentrate scientific-technical forces on a limited number of objectives where [Czechoslovakia] seeks and has the prerequisites for reaching leading technical and economic levels or achieving important non-economic objectives" (Vavrousek, 1986). Policy objectives were organized into eighteen state programs for technological progress, which were then broken down into some 60 so called programs of most important structural changes (misc.). The actual implementation of the program at the level of associations and enterprises was embodied in hundreds of tasks or assignments. Coordination of each program was assigned to a general director who was to be responsible for both the conception and execution of activities needed to carry out the program. In 1973 these directorships were abolished and the programs fell under the aegis of newly formed departments of the Federal Ministry (later State Committee) for Technology and Investment, a change in organization that opened the programs to parochial interference by branch ministries (Vavrousek, 1986, pp. 848-849).

The conception of industrial policy in Czechoslovakia

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\(^3\) Indeed, much of the post-1968 period was characterized by the use of gross value of output, with all its attendant drawbacks, as the indicator of enterprise performance, as well as by are centralization of financial and other controls over enterprise activity (Csaba, 1983).
suffered from two faults. First, the criteria for determining which sectors were to be promoted were never clearly articulated, and thus the choice of the state programs in 1970 was an "intuitive" one made on the "basis of practical experience" (Vavrousek, 1986, p. 848). Despite this rather ad hoc choice of priority sectors, the list of state programs for technological progress remained largely unaltered for over 15 years. A second problem was that these programs were developed outside the normal process of drawing up the five year plans. Thus although approved at the time of the passage of the FYP into law, the development programs were never considered during the discussion of the plan, nor were they an organic part of it (Backova [1986]). This led to excessive investments during the implementation of the fifth FYP as well as a general scramble for resources on the part of enterprises. In subsequent FYPs the coordination of investment outlays was improved, but little else was done to bring program tasks into the ambit of the plan. Moreover, enterprises participating in these programs, 28 percent of all Czechoslovak enterprises in 1976-80 and 39 percent in 1981-85, had special allocations for hard currency imports, priority access to labor (Altmann, 1982) as well as special allocations of investment resources.

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4Vavrousek (1986) refers to some criteria, such as a desire for technological breakthroughs, economy-wide effects, and a consistency with the international division of labor. Csaba (1983), p. 80 mentions more specific, but nevertheless not very operational, criteria such as trends in the structure of production, the state of R & D, material-intensity of production, the size of production runs and investment requirements.
Among the sectors included in the state programs were electronics and electrical engineering, computers and cybernetics, chemicals, nuclear technology, metallurgy and machine building to name only some of the more traditional favorites of Czechoslovak planners. Somewhat more surprising choices were programs to make better use of forest resources, to improve materials handling, to achieve self-sufficiency in animal feeds and to improve food supplies. Clearly not all programs were accorded the same importance and consequently the same level of resources, and by the time of the 1981-85 FYP a number of the state programs had only a few ongoing tasks, while others served merely as umbrella designations for uncoordinated research and development efforts at the enterprise or association level.

Despite the lack of clear-cut criteria for selecting priority sectors, the dysfunctional recentralization of the Czechoslovak economic system, and the excessively broad themes of the state programs, there are a number of positive features in Czechoslovak industrial policy that bear mention. The first of these is a consistency in terms of programs promoted and in terms of the target market. Although the number of tasks at the level of the most important structural changes has been reduced over the years, it appears that key programs in nuclear energy, machine building, and electronics have continued to receive support for a significant period of time. A second area of consistency is the choice of the target market which has clearly been CMEA and the Soviet Union in particular. Like Bulgaria, Czechoslovakia has assiduously cultivated the Soviet market, seeking to obtain a
secure market for its products through Soviet-Czechoslovak bilateral agreements on product specialization, cooperation in research and development, and on trade as well as through similar multi-lateral agreements with all CMEA members (Blaha, 1986; Terek, 1985; Skolkova, 1986).

The program that best fits the popularly conceived objectives of industrial policy, and one that in many ways may be both the largest and most successful of the Czechoslovak development programs is the nuclear energy program (Kucera, 1984). Czechoslovakia undertook to develop the capacity to construct nuclear power reactors of the Soviet VVER-440 design and subsequently its larger version, the VVER-1000. The program was based on traditional Czechoslovak skills in metallurgy and heavy engineering. At first the program concentrated on components such as pressure vessels, tubing and turbines, but has been considerably broadened over time, so that Czechoslovakia is the major co-constructor, along with the Soviet Union, of nuclear powerplants within CMEA. In view of the growing demand for nuclear power in the region, and the improbability of serious competition from suppliers outside CMEA, Czechoslovakia has achieved a significant monopoly position in an important and growing market.

German Democratic Republic

As in the case of Czechoslovakia, slow economic growth, the exhaustion of labor reserves exacerbated by the loss of workers to the West and declining export competitiveness led to the
formulation of a comprehensive industrial policy. Although reforms had begun in 1963, the pace of economic reform accelerated sharply in 1967 as part of the effort to implement an industrial policy based on the fullest utilization of science and technology. The strategy of the GDR's industrial policy was expressed by the slogan "uberholen ohne einzuholen" which may be translated as to surpass without equalling, indicative of a desire not merely to catch up technologically with advanced western countries but rather to surpass them through bold technological breakthroughs.

This policy was to be implemented by means of systemic changes, by organizational restructuring of industrial units and by providing favorable access to resources for enterprises engaged in priority activities, the so-called structure determining tasks. The most significant organizational change involved the formation of industrial associations, called VVBs in the GDR, which took over many of the functions of the industrial ministries. Subordinate to the VVBs were the kombinate, or combines, formed from large enterprises and their sub-contractors, and enterprises. The VVB organized the productive activities of its subordinate units, imposed targets on them and could transfer investment and wage funds from one unit to another. It also financed and organized research and development activities (Granick, 1975, pp. 138-144). There is little evidence that such a concentration of industrial production reflected an industrial policy geared toward capturing economies of scale in production. Rather, given the science-based nature of the GDR's policy, such concentration was viewed as valuable because it led to economies of scale in
research and development. On the other hand, the organization of kombinaten was viewed as assisting a science-based industrial policy by coordinating relations between suppliers and consumers of industrial components (Bentley, 1984, Ch. 6).

The formation of the VVBs was accompanied by systemic changes, although these were, somewhat paradoxically, less important for priority than for non-priority sectors. Profitability replaced output as the main indicator of enterprise performance and the tautness of plans was reduced so that VVBs could shift resources so as to increase profitability. A centrally determined and VVB-specific proportion of profits was retained to finance investment. VVBs also assumed responsibility for setting prices. Structure determining tasks, and the units charged with executing them remained under central control. In contrast to the general use of financial levers to guide enterprise performance, structure determining tasks were centrally planned in physical terms which then served as targets for producing units. Thus units engaged in structure determining tasks had less leeway to make adjustments that would increase profitability and thus their investment funds. On the other hand, central direction in physical terms may have been viewed as a useful way of breaking enterprise resistance to the introduction of new technologies and products (Bentley, 1984, Ch. 7).

However much units in priority sectors may have suffered from their inability to adjust so as to earn higher profits, they benefited from priority access to resources. In terms of bank credits, enterprises engaged in structure determining tasks were
not subject to bank-imposed penalties for low profitability and also had preferential access to credits. The number of workers that priority enterprises could employ was determined only by the state planning commission and by the appropriate VVB, whereas labor allocations to non-priority enterprises were subject to regional economic councils. Moreover, local authorities assisted priority firms in attracting their allotment of workers by financing workers' housing. Finally, within the supply system, enterprises engaged in structure determining tasks had priority for the supply of inputs over other enterprises except those providing raw materials and inputs needed for the normal functioning of the economy.

This experiment with an ambitious science-based industrial policy implemented by centralized directive but within a relatively decentralized environment was short-lived. This may partly have reflected the transfer of leadership from Ulbricht to Honecker. In any case, amidst complaints of excessive levels of investment and shortages of raw materials, all production, rather than only that of priority products, was centralized and subject to physical planning. In 1972 structure determining was dropped as an appellation for priority sectors and replaced by the less urgent adjective, important. With the increased centralization, VVBs lost many of their former powers and during the course of the decade were disbanded with their functions taken over by the branch ministries or by the kombinaten. Similarly, the use of financial levers declined to be replaced by the volume of production, value added and material intensity as the primary
enterprise indicators (Csaba, 1983, pp. 36-37). The process of forming kombinaten was completed in the early 1980s, and the state undertook a series of measures to exploit the new organizational form. The kombinates were given broad responsibilities for research and development. The hope was both to make research and development more relevant to industrial needs and to speed its diffusion. The fact that in most kombinaten the director of the kombinat is also the director of the leading enterprise ensures that the kombinat's technological decisions are made by someone with practical experience. Kombinaten were also given the right to engage in foreign trade transactions, under the supervision of the Ministry of Foreign Trade, and the responsibility within the Kombinat for overseeing export performance fell on the Deputy Director. All kombinaten were expected to export, and export performance influenced the kombinates investment and bonus funds. Despite this wholesale organizational and systemic overhaul, a number of elements of the original industrial policy remain. These include slack planning, emphasis on the application of science and technology and a belief that large economic units are best suited to the discovery and application of new technologies.

Unfortunately, while the means for implementing industrial policy in the GDR have been amply documented, the objectives of this policy, in terms of sectors to be promoted and markets to be served, can only be conjectured. Between 1967 and 1971 the structure determining tasks were a secret and in the mid-1970s the

5 Notice the contrast to the Czechoslovak case where development programs were only briefly administered in this way before being made subordinate to Ministry departments.
GDR ceased publishing a sectoral breakdown of industrial investment. Nevertheless, one can infer the GDR's structural priorities both from the statements of the leadership and by examining rates of growth of output of various sectors of industry on the assumption that priority sectors did grow more rapidly than others. During 1967-70, the period of attempted leapfrogging of world technological levels, fast-growing sectors included chemicals, especially petrochemicals and pharmaceuticals; machine building, especially machine tools, chemical plants and agricultural machinery; and electronics and instruments including data processing machines, fine mechanical optical apparatus and process control equipment. In the 1970s, lignite and brown coal production clearly became priority sectors, despite their incongruence with the high-tech profile of industrial policy. In chemicals, the stress on petrochemicals abated, but pharmaceuticals continued to be emphasized. In engineering the emphasis on machine tools and complete plants and refineries appears to have been supplemented by cars, railroad rolling stock and ships. The emphasis on electronics continues, as this sector is viewed as critical not only for the country's export performance but also for the general level of competitiveness that can be achieved by other sectors of the economy through the application of computers, robots and other electronic devices (Machowski, 1985, pp. 49-51). Whether all of these have been or are the objects of industrial policy is unclear, and thus it is difficult to assess whether industrial policy has had a favorable effect on the economy. On the positive side, the performance of the economy in the 1980s
compares favorably with that of the other countries in our sample. Nevertheless, there are expressions of dissatisfaction in the GD Rover the inability to narrow the range of engineering products and to effectively link science and industry, two objectives of any science-based industrial policy.

Hungary

Hungary has pursued industrial policies both under the traditional system of central planning and during the period of the New Economic Mechanism (NEM). Thus the Hungarian experience is a particularly instructive one in that it offers some insight into the possible role of economic reform as a general sort of industrial policy aimed at a more rational use of resources and an increase in factor mobility.

As early as the 1950s, Hungary chose to promote large scale production of diesel engines, motor vehicles, machine tools, telecommunications equipment and machinery for the food industry. The impetus for these programs came from the existence of a large market for such products in the Soviet Union and what the Hungarian authorities perceived as the existence of firm-specific advantages and the potential for capturing economies of scale. These efforts proved, to a large extent, to be unsuccessful (Schweitzer, 1980). Because policies were imposed "from above", anticipated firm-specific advantages were not carried forward to the new products. Moreover, the high degree of vertical

\[6\] A more extensive treatment of Hungarian industrial policy can be found in Brada (1984).
integration of Hungarian enterprises forced the enterprises to produce most of the required components. Thus potential economies of scale at the assembly stage were offset by diseconomies encountered in the production of components.

With the introduction of NEM came new instruments for the promotion of priority sectors. Capital was provided by Central Development Programs (CDPs) and by means of credits, taxes and subsidies that were set at the level of the firm (A. Balassa, 1975). Six CDPs were planned for 1971-1975. They included the expansion of the natural gas network; the development of the aluminum, petrochemical and motor vehicle industries; the promotion of computer manufacture and utilization; and the use of light-weight structures in construction. Some sectors, such as gas, computers and petrochemicals were to provide externalities for other sectors of the economy; vehicles, aluminum, petrochemicals and computers were to be exported to CMEA markets; and computer production was expected to replace imports from the West. Neither the vagueness of these criteria nor the domestic and CMEA orientation of the program survived the impact of the oil price shock.

At the October 1977 meeting of the Central Committee of the Hungarian Socialist Workers' Party a new approach to industrial policy was put forward (Nemeth, 1977). This stressed energy production and utilization, engineering, light industry and agriculture as priority sectors. Within each industry production was to be narrowed in order to focus on modern high quality products that could compete on both western and CMEA markets. A
special fund of 45 billion forints was established to finance investments that would increase exports to the West.

Despite these changes, Hungarian industrial policy has continued to be the object of a lively debate within Hungary. The emphasis on economies of scale as a criterion has been criticized because the vertical integration of Hungarian firms and the practical impossibility of an effective intra-CMEA supply of components prohibit the achievement of such economies (Roman, 1978). The emphasis on CMEA as a reference market has also been the subject of some controversy, in that it is viewed as an undemanding market that does not force Hungarian producers to meet world standards. While it is true that the CMEA market absorbs many low quality goods that are at the mature stage of their product life cycle, it clearly would not reject modern high quality goods. The problem then would seem to be one caused by the domestic system rather than by the characteristics of the CMEA market. Finally NEM itself has been regarded as a barrier to industrial policy in that investment continues to be more centralized de facto than the blueprint of the NEM suggests.

Poland

Poland's effort to formulate a coherent industrial policy based on specialization dates from 1968 when Girek proposed that foreign trade become the determining factor in Polish economic progress, which to date had been disappointing. Certain branches

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7This analysis of Polish industrial policy is largely based on J.M. Montias' contributions to Brada and Montias (1984, 1985).
of industry were to become leading sectors whose above-average growth would pull the remainder of the economy to a higher growth path. These branches were to be selected for their ability to earn foreign exchange effectively and to penetrate world markets. Although all enterprises would be expected to seek to export, it was proposed that within each priority branch one or more enterprises would be singled out for the production of exports. Priority sectors and firms were to benefit from earmarked investment outlays and from special access to bank credits and foreign exchange.

The selection of sectors to be so favored sparked a debate between so-called minimalists, maximalists and compromisers. Minimalists argued for the promotion of industries where economies of scale and firm-specific advantages already existed, as in shipbuilding, railroad cars, construction equipment and textiles from natural fibers. Maximalists, on the other hand, wanted to promote structure-determining sectors, such as electronics, nuclear technology, chemicals, and synthetic fibers. The compromisers proposed criteria that looked to foreign market conditions, the growth or size of world demand, as criteria for selecting industries to promote.

The proposed policy was never implemented. In part this was due to the eagerness of all firms and sectors to become a priority sector and thus to benefit from the advantages offered to the favored firms. Too much of production was to be favored, which of course meant that, in fact, none could be favored. In any case, the Polish government had by then adopted a macroeconomic strategy
that obviated the need to make choices among sectors. All Polish industry could be favored by means of imports of western technology and equipment. However, this dispersion of resources failed to produce any economies of scale, firm specific advantages or spillovers to other sectors.

As in several other countries in our sample, there are serious weaknesses in the implementation of industrial policies in Poland. In part, the weaknesses stem from similar causes, among them the unwillingness or inability of central authorities to deny resources to entrenched ministry and enterprise interests, the lack of adequate incentives to promote efficiency and innovation and general macroeconomic disequilibrium. In contrast to the lack of strong incentives for participating in industrial policy apparent in Czechoslovak experience, Poland appears to have had excessive incentives for enterprise participation and a faulty or ineffective means of screening out those enterprises unlikely to be successful. There was also less consistency in industrial policy: Polish criteria for choosing priority sectors were unsettled and changed overtime. The most striking difference between the industrial policies of the countries examined so far and Polish industrial policies, however, was that these countries' choice of sectors appeared to have been made with reference to the needs of the CMEA market while, at least in the 1970s, Polish industrial policy was being framed with view toward developing the capacity to export to western markets. Despite these differences, Poland's choices of industries to develop overlaps those of the other CMEA countries list in a number of categories including
cars, machinery and electronics.

Romania

Industrial policy in Romania has been strongly influenced by environmental and foreign policy factors. Like Bulgaria, Romania began socialist development as a relatively agrarian economy, and thus industrial policy was more a structural policy based on the rapid expansion of industry through large infusions of capital and of labor released from agriculture. At the same time, the industrial sectors that grew most rapidly partially reflected Romania's natural resource endowments. Unlike Bulgaria, Romania neither sought to create special niches to exploit within the branches of industry associated with traditional socialist industrialization, nor selected priority sectors with a view toward the needs of the CMEA market. Rather, somewhat as in Poland, domestic needs, possibilities for exporting to developing countries and the developed market economies as well as the possibilities for importing machinery and technology from the West predominated in decisions regarding priority sectors. The sectors demonstrating most rapid growth since the 1960s have been electrical power generation, metallurgy, machine building, chemicals and clothing and textiles.

The development of the metallurgical sector in Romania has played a pivotal role in Romania's developmental and foreign policies. It was the Romanian-Soviet dispute over the expansion of steel-making capacity in Romania that focused attention on Romania's conflicts with CMEA and helped to turn Romanian trade
toward the West. Despite a dependence on imports of ore and coking coal, Romania has continued to push for the expansion of steel-making, to the point where domestic demand, in the aggregate if not in terms of individual steel products, is more than met by the output of the Romanian steel industry. In recent years efforts have been made not only to continue the expansion of steel production so that Romania's steel production should exceed, on a per capita basis, that of all other CMEA countries save Czechoslovakia, but also to improve the product mix of the industry (Jackson, 1977, pp. 914-915). The latter goal appears to be motivated by the desire to reduce imports of specialty steels, steel plate and steel forms.

Like the development of the steel industry, the development of the machine building sector in Romania was based on a strategy of import substitution. At first Romanian machinery production was characterized by long production runs of fairly simple machines geared primarily to the needs of the domestic market. In the 1970s a trend could be discerned toward the production of more sophisticated machinery, including cars, aircraft, computer peripherals, tractors and electronic equipment. In these sectors, promoted in large part on the basis of their structure-determining characteristics, an interesting form of support was the extensive use of foreign technology and equipment. Indeed to some extent Romanian efforts to industrialize by using western technology and credits parallel to those of Poland. There are, however, important differences between the role of the West in each country's industrial policy. In the case of Romania, there
was a rather creative approach to the use of joint ventures and industrial cooperation with Western firms to facilitate technology transfer and the export of industrial products to the West, although, in contrast to Poland, the actual amount of Western capital imported was a small proportion of total machinery investment. Despite its rapid development, the Romanian machine building industry continues to suffer from an inability to specialize production and focus efforts on a narrower and more internationally competitive product line. In large part this may result from Romania's inability to select an appropriate target market. With trade split between CMEA and the West, Romania cannot serve either market effectively. The country's large size and voracious appetite for investment goods has permitted the domestic market to drive industrial policy. A World Bank survey (Tsantis and Pepper, 1979) written in 1979 observed that "(u)ntil a few years ago, it would have been difficult to identify industrial projects developed primarily for the export market." Even products in which Romania has some relatively focused export advantage, such as oil-field equipment, tractors and chemical plants, were developed at first to meet domestic needs and only began to be exported when domestic production, perhaps fortuitously, outpaced demand.

Because Romania's oil fields had been extensively developed before World War II, Romania had the requisite skill to expand the chemical industry. At first the petrochemical sector was expanded on the basis of domestic production. However, oil production could not keep up with both the needs of the expanding chemical
sector and the energy needs of the rest of the economy. Consequently in the 1970s, and particularly after 1975, Romania began to import large quantities of oil, not from the Soviet Union but rather from developing countries. Romania thus was wagering that even by paying world market prices for feedstock for its petrochemical sector a profit could be earned by exporting the products of the petrochemical sector in the West. Unfortunately, the excess refining and chemical capacity in the West kept the price of such products from rising as rapidly as did the price of crude oil (Jackson, 1986b, pp. 500-502). Thus in Romania's one export-oriented sector both declining domestic sources of advantage and developments abroad have conspired to sharply reduce gains to the economy.

In view of Romania's abundance of labor, it would seem rational to develop some labor-intensive sectors in order to move workers from agriculture to industry and thus to expand that proportion of the labor force that is disciplined to factory labor and the use of industrial equipment. While they do not fit the Romanian leadership's view of modernity as do the sectors discussed above, the textile and clothing sectors do provide opportunities for creating numerous low skill and low capital intensity jobs. Because of this, these two sectors have experienced rapid growth, both when compared to more "prestigious" sectors and to the rest of light industry (Tsantis and Pepper, 1979). The exports of these goods also have expanded rapidly despite occasional difficulties over allegations of dumping by developed countries.
There is little evidence of extra-plan mechanisms for allocating resources to priority sectors. The Romanian planning system is rather simple and oriented toward physical indicators. Planners appear able to direct funds to meet their investment objectives and there is sufficient labor to man new plants. Consequently the type of extra-plan mechanisms evident in Czechoslovakia and Hungary do not appear to be needed in Romania. Romania has nevertheless promoted its priority sectors in two ways. First, it has sought to create favorable opportunities for export. In the West this has taken the form of efforts to improve access to developed and developing country markets by means of an aggressive diplomacy. Romanian pressure for MFN status from the United States, a flexible attitude toward negotiations with the European Community and an effort to present Romania as a non-aligned developing country are more notable examples of such a policy. Romania has also priced its products aggressively and, as a result, both steel and textile products have been subjected to restrictions by the United States or the European Community. Within CMEA, Romania has attempted to build an export position based on specialization, but, given Romania's maverick economic and foreign policies and the decisive importance of Soviet cooperation for the success of such specialization, it is not surprising that little has been achieved. The other form of support for priority sectors has come from the importation of technology and capital from the West often through industrial cooperation and joint ventures with western firms. However, given the overall size of Romania's industry and the small scope of
cooperative ventures with western firms the impact of such measures on the performance of Romanian industry cannot have been great.

A COMPARISON OF EAST EUROPEAN INDUSTRIAL POLICIES

The foregoing survey of industrial policies in Eastern Europe reveals many similarities as well as some important differences between countries. The specificity and completeness of criteria for selecting sectors to be promoted are not impressive in any of the countries studied. Nevertheless, in all countries the same major sectors; engineering, chemicals, and electronics have been targeted for special attention. One reason why such similar choices were made by the East European countries is their overriding need to keep up economically and technologically with the developed market economies. Since there exists a considerable technological gap between Eastern Europe and the developed market economies, the pattern of structural change needed in the East is evident from the recent experience of the West. Thus the choice of priority sectors in Eastern Europe must revolve much more around which specific aspects of recent structural changes in the West are to be promoted through industrial policy and which ones are best left to others. In this sense the choice of sector is considerably easier than it is in developed market economies, because the broad outlines of what needs to be done already exist and both the technical feasibility and market acceptance of new lines of endeavor have been demonstrated.
The similarities in the effects of industrial policy on the pattern of industrial employment, production, and foreign trade has been investigated in Brada and Montias (1984, 1985) and is currently being investigated in depth for Bulgaria by Montias. One methodology that we have employed is to calculate cosines of vectors of sectoral growth rates, sectoral employment growth and export growth rates. The results of this technique suggest that the effects of industrial policy are better reflected in intra-CMEA trade than in CMEA trade with the West. Montias is examining the output and export trends of sub-branches of machine building in Bulgaria and comparing them to the trends in machine building as a whole in order to uncover the pattern of leads and lags in the implementation of industrial policy and its effect on trade flows.

Excessive reliance on data aggregated to the levels employed in the foregoing analysis can lead to the erroneous conclusion that all East European countries are following identical industrial policies and thus are competing with each other, either for a finite CMEA market or, by means of import substitution, for their domestic market. To some extent this is the case, as much of the East European literature on CMEA integration complains. At the same time, it must be recognized that a parallel development of the same sectors need not be competitive if it stimulates intra-industry trade. The Czechoslovak nuclear energy program, Hungarian bus production, and Bulgarian fork-lift trucks are examples of such a policy, with each country specializing in one sector of the engineering industry. With such a strategy, all
CMEA countries could choose machinery, chemicals and electronics as priority sectors, as they have done. With sufficiently narrow specializations within each of the sectors, intra-sector trade in components and final products could be based on national advantage. The Bulgarian strategy of providing components to Soviet enterprises is one example of such a strategy. Czechoslovakia has signed long-term specialization agreements with the Soviet Union in a number of industries. In chemicals, the Soviet Union exports energy-intensive and bulk chemicals to Czechoslovakia in return for pharmaceuticals and fine chemicals (Skolkova, 1986). In the engineering sector the two countries have agreements for bilateral specialization in, and exchanges of, engines, tractors, agricultural machinery, etc. (Terek, 1985).

To coordinate intra-industry specialization among the East European countries requires a degree of supernational planning and coordination that CMEA does not have. As a result, most CMEA countries have taken the Soviet market as the reference market for their industrial policies. The Soviet Union has a pivotal role in promoting this tendency for intra-sector specialization because the Soviet market absorbs the bulk of products produced within CMEA under specialization agreements (Machovski, 1985; Clement, 1985). Moreover, to the extent that countries' priority sectors are reflected in the specialization positions they obtain within CMEA, those countries whose industrial policies are oriented toward the Soviet markets account for higher shares of CMEA exports of these products. Thus Bulgaria, for example, accounts for 16 percent of CMEA exports of specialized products while much
larger Poland accounts for only 11 percent. That such specialization occurs at the level of intra-industry rather than inter-industry trade shows the growing role of specialization in the chemical industry.

Only Poland and Romania have not chosen the CMEA market, and the Soviet market in particular, to guide their choice of priority sectors to the same extent as have the other CMEA countries. In the case of Poland the reference market was the world market and particularly reflecting the predominance of the developed market economies in world trade, the developed West. In the case of Romania the domestic market and to a lesser extent the developed West appeared to be the markets whose needs guided industrial policy. It is noteworthy that such choices of reference markets implied a reduction in reliance on CMEA and a willingness to expand relations with the West, both for increased imports of technology and equipment and as a market for exports. The efforts of both countries in this regard proved unsuccessful, although whether the failure was due to shortcomings in industrial policy or to lamentably poor macroeconomic policies is unclear. What is certain is that to date no socialist country has successfully implemented industrial policies geared toward western markets.

In the means used to promote the growth of priority sectors, there are both similarities and differences among the East European countries. While changes in the system of economic management as a means of stimulating the performance of priority sectors has been attempted in virtually all countries, there appears to be little agreement on which changes are likely to be
more beneficial. While the GDR and Czechoslovakia have moved toward greater central control over resource allocation, Hungary has decentralized, yet no clear cut advantage appears to adhere to either approach. Much greater agreement seems to exist on the benefits of reorganizing industrial enterprises into larger units, or associations, which can cut across industry lines and can combine production with research and development and foreign trade activities. Most obviously in the case of the GDR, but in the other countries as well, enterprise amalgamation was seen as an important means of increasing export competitiveness through accelerated technical progress.

The allocation of resources to priority sectors is relatively commonplace in all countries. Perhaps the greatest difference is to be found in the importation of Western technology and equipment for priority sectors. This was a key element of industrial policies in Poland and Romania, and was used to an appreciable extent in Bulgaria, Hungary and the German Democratic Republic. In Czechoslovakia it has played a minor role. Among the more developed countries, there is greater evidence of extra-plan mechanisms for allocating capital and labor to priority sectors, mechanisms that appear to be less necessary in the less industrialized economies. Given the complaints in the literature of many countries about the diversion to other uses of resources obtained by means of these priority allocations, it is evident that such extra-plan means of allocating resources may not be very effective in stimulating the output of the products intended.

Finally, the promotion of exports has been carried out
largely within the framework of CMEA specialization and in particular within bilateral specialization agreements with the Soviet Union. Romania and Poland have been less effective in this respect than have the other socialist countries, primarily because they chose not to view the Soviet Union as a reference market. To what extent one wishes to view the other CMEA countries as being successful in their trade-promotion efforts depends in large part on one's assessment of CMEA integration. Clearly there have been difficulties in the conceptualization and implementation of socialist economic integration. At the same time, intra-industry trade, particularly in those sectors where industrial policy is at work, has increased within CMEA. Perhaps the clearest conclusion here is that the Soviet Union plays just as important a role in the success of the industrial policies of the East European countries as it does in overall CMEA trade.

Clearly there are problems and disputes within CMEA over specialization. Such conflicts also exist within the EC, where industrial policy in sectors such as steel, computers, telecommunications, and aircraft have created strains. It is worth noting that in both static and dynamic terms the CMEA in fact appears to be at least as effective a regional integration scheme as the EC (Brada and Mendez, 1985, forthcoming).
REFERENCES


*Copies may be obtained from the National Council for Soviet and East European Research.*