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CROSS-HISTORICAL GLOBAL TENDENCY OF INDUSTRIAL DEVELOPMENT

Underlined here is that approximately from the beginning of the 80s the economy of the industrial countries entered a qualitatively new phase and model of development. This started the process of radical change in the world economy and in the development of the society in each country.

Analyzed are part of the most current questions of the social science in the whole world which besides the pure scientific, they also have a huge practical value for each country, as follows: what necessitated the qualitatively new change; what are the main features and specifics of the emerged model in comparison with the previous; to what more different type of economic activity and society it leads in more long-term horizon; what challenges the model provokes before the society theory and practice today and tomorrow.

An attempt here is made to outline and draw the determining characteristics of a global tendency in the industrial development as a basis for more detailed identification of the new economic and social model. Based on this, formulated here are the two most possible historical alternatives for the further development of Bulgaria.

JEL: B22; B41; L16

Approximately since the beginning of the 80s the economy of the industrial countries entered a substantially new stage and model of development. A radical turn in the whole world economy and in the social changes of each country started with this.

The clearest indications for the essence of the new model are the increasingly closing to one another accents of the industrial policies of the leading countries in the 90s. These accents are transition to a *complex long-term* state *strategy* for *mass development* and introduction of high technologies; creation of an active environment for priority investment in the so-called “branches of the future”; increasing direct subsidies in the science, education and vertical-horizontal diffusion of the innovations as first-rate strategic factors for achieving high technological, competitive and sustainable economic growth.

What imposed the substantially new change; what are the main features and specifics of the emerging model, compared with the previous one; to what different type of economic activity and society does it lead in a long-term plan; what challenges does the model put to the social theory and practice today and tomorrow? These are part of the most actual cardinal questions in front of social science in the whole world, since besides being purely scientific, they constitute also a huge practical value for each country.

An attempt is made here to help a more detailed clarification of the determining features of the new model as reference point, first, for revealing the coordinates of Bulgaria in the total economic development of the world, and second, as a target base for development of an effective national strategy for the creation of a modern, competitive market economy. (The development of the strategy for Bulgaria is, of course, outside the range of the article.) The attention is pointed only towards industry as a main structure-determining sector.

Since a substantially new model of economic development replaces the former one, the most important features of the new one can be drawn with significant reliability from the tendency of development in the analog characteristics of the previous model. This is why the chosen model is historically logical. The identification of the features is done on the basis of the logical tracing of the most essential qualitative changes in the former global industrial development and of their extrapolation in the near future.

The revealing of a tendency is a type of periodization of the relevant development from certain aspects and criteria. The periodization which is interesting for us is based on a change *in principle* of the economic approach and exploitation of the nature resources in the main *stages* of the industrial development. The accents, marked in the beginning, of the industrial policies of the developed countries in the 90s allow the principle changes to be determined as a qualitative evolution and turn from the dominating extensive (i.e. relatively one-side) technological use of the nature resources to their dominating intensive (more and more deep and complex) processing based on scientific knowledge. The motive for these evolutionary changes is the natural desire of the economic agents for higher (than the competitors) effectiveness, profit and competitiveness. The problem of the periodization of the industrial development in such case is revealing and characteristic of the most essential gradual qualitative stages of progressive change in the ratios from totally dominating resource-intensity to totally dominating science-intensity. (This study is structured correspondingly.) Or the tendency we are interested in can be formulated preliminary as a development from *resource-intensive* to *science-intensive* industrial epoch. The outside concretely historical limit, which separates them, is the resource-energy crisis (the so-called “petrol shocks”) which happened in the 70s of the 20-th century. It was then that humanity started the radically reconsidering and sharp turn towards fuller processing of nature resources, based *totally* on the scientific and innovation activity.

The close tracing of the changes here is made according to four major indications through which the main criterion is practically realized. These are principle changes in: the technological way for industrial processing of the raw materials and the energy; the model for execution of the inter-production links and in its corresponding mechanism for development of the macroeconomic structure as basic characteristics of the changing technological way for processing and its effectiveness; the role of science and innovations for achieving higher effectiveness and competitiveness; the main economic functions of the state and relatively in its industrial policy as a historically increasing factor of the effectiveness and competitiveness.

The First Stage of the Resource-Intensive Epoch

It matches totally the time of the so-called industrial turn (the end of 18-th and the beginning of 19-th century). In the different countries its duration is about one century. As far as the contemporary term for industry is connected with big machine production, its

beginning is marked by the emerging and increased expansion of the machine technologies. Their continuous improvement based on the innovations increases the effectiveness of the production processes many times compared with the *pre-industrial* epoch. Mainly because of this the sectors, in which mechanization was first introduced, usually start to dominate and after that they turn also into *structure determining* for the whole economy. In the area of the economic initiatives as a rule they also attract central attention and become priorities for the private entrepreneurs, as well as for the economic policy of the state.

Although significantly more effective, the early machine technologies actually create products with considerably low degree of processing from stone, wood, leathers, plants, ores, rubber, cork. The processing is strongly one-sided, the output from a unit of raw material and nature energy is low, the usefulness of the final products – close to the one of the raw material. The creation of the ready product is based on a too limited knowledge of the natural laws and the practical opportunities of their application. The new sporadic ideas for development are addressed mostly towards the direct production activity; their long term application is limited only in the framework of a certain *production operation*. The time between the fundamental discoveries and the applied innovation-technology decisions is so long that the problems, connected with their impact and development as a specific factor of the economic effectiveness, are still not an object of independent initiatives. Actually in the whole period the determining factor of the competitiveness is another one. The earlier the period of the industrial development is, the higher is the degree, to which the economic effectiveness and competitiveness are a function not mainly of the innovation factor, as it is now, but mostly of the individual access to the exploitation of the richer and more qualitative natural resources. In equal other conditions, the more direct and cheap the access of a certain producer to natural raw materials and energy is, the more competitive his production is. The first industrial activities, developed closely to the areas of the relevant natural resources, and thus they have been the most profitable.

The considerable slowness of the production processes and communications not only does not allow, but from the point of view of the effectiveness, objectively forces the *inter-production links* to be executed for a long historical period *exclusively* through self-regulation based on the market-price mechanism. The forming and development of the *macroeconomic structure* is achieved also only a posteriori, in self-evolutionary way as a result of the dynamic changes in the direct market links and situation. In the practical economic consciousness and later in the emerging economic thought this way and mechanism for a long time (and in some doctrines till today) are accepted as without alternative and as the only possible in principle.

The dependence of the effectiveness and competitiveness mostly on the exploitation of richer natural deposits determines the character of the state economic initiatives. They remain for long totally neutral to the *close* production activity and the *current* market situation. All aspects and problems of the

technological way (and respectively the effectiveness) of processing the raw materials to a ready product are a concern only of the direct producer. The same goes for *innovations*. Since the new technological decisions are first realized quite slowly and only in the frames of the production activity of a certain firm, *the connected with their development and introduction problems do not exist at all as an object and initiative in the industrial policy of the state*. Furthermore, even till the middle of the 20-th century, in the economic theory dominates the understanding that the state in principle, i.e. also in the future, should remain totally aside from the problems of technological development. This concerns also the investment costs connected with innovations. In the more developed countries the state at that time had the obligation only partly to finance education and many branches of the fundamental university science. But between the latter and the development of the industrial technologies from outside does not exist any direct functional dependence, *because of which they do not exist at all as elements of the industrial policy*. On the other hand, the considerable slowness of the production processes does not provoke a practical need for long-term forecasting and projecting on a company as well as on a macro level. For the same reason it also does not exist as an element of the industrial policy of the state.

In longer-term plan the central attention of the state initiatives in the early period of the industrial development is focused exclusively on the insuring of more sustainable favorable foreign economic conditions for real access of its “own” firms to rich natural deposits, since exactly this wayline the biggest advantages in the competitive battle are won. Especially in the countries with poor natural resources the state is actively engaged using all instruments of its foreign policy, incl. military, in the conquering of other territories with rich natural resources. In this connection we should well remember the widely developed colonial practice in the world till the beginning of the 19-th century.

The Second Stage of the Resource-Intensive Epoch

This main stage of the resource-intensive epoch begins mostly with the separation of the processing from the extracting activities. In it the industry is separated from its extracting-processing character and directs its development mainly towards more effective processing of the raw materials. Determined are industrial sectors with substantially new technological processing – ferrous and separately non-ferrous metallurgy, general machine-building, shoe, textile, sewing, food and other branches, construction, machined shipbuilding. In these sectors the profile and the useful properties of the final product start to depend not so much on the natural qualities of the input raw material, but on the character of the processing operations because of the significantly more active innovation activity. If during the whole first stage the determining factor of the economic effectiveness and competitiveness remains the differentiated private access to more and more qualitative natural resources, here the technological initiatives stand next to this same factor as a second main and expanding track of the effectiveness and

competitiveness. Besides, unlike during previous stage, where the innovation activity and mechanization are located mostly in the different production operations, in the second stage they begin technologically to transform whole blocks of the production activity. Emerges the system of machines. The profession "inventor" is determined as a separate one. Mechanization enters also the inter-production links, with which in a certain economy ends the industrialization phase in its traditional meaning.

Therefore, during the second stage of the industrial development new opportunities for increasing the micro and macroeconomic effectiveness and competitiveness *in principle* emerge. They are already based completely on the innovation activity. Besides, on the line of the mechanization, the new principle opportunities aim also in the direction of the *active qualitative restructuring* and optimization of the inter-production trade links, which is a basic functional component of the forming macroeconomic system. Gradually the increasing, as a result of the mechanization, production effectiveness, differentiation and economic dynamics after certain critical threshold insistently put forward the necessity to insure a no-problem, timely, sustainable and effective communications, transport, legislative environment, market infrastructure, as well as an adequately changing macroeconomic structure. The necessary *innovations* for their relevant development provoke the emerging of new scientific directions and algorithms like the transport problem solution, linear programming, logistics, and balance of the inter-branch links.

Therefore besides a period of qualitative and quantitative jump in the development of all concrete industrial activities, during the second stage also the inter-production specialization and cooperation, infrastructure, macrostructure, complex dimensions of the industrial activity in national scale are intensively developed. Their new characteristic is not a total denial of the previous one. Although they consist of more or less old elements, it is actually a substantially new level that requires a *substantially new way of market interaction and communications*. The longer-term initiatives on the creation of an adequate macro infrastructure and the overcoming of the natural delay in the development of the macroeconomic structure are of special actuality for the firm and the total competitiveness of the economy already. In all advanced countries the state starts to participate directly in the solving of these problems. Or this is the stage of the forming of the industrial production as a macro system not only in self-evolutionary way, but also through expansion of the functions of the state. *From mostly registrating, the latter turn into active ones*. Usually in the leading countries, where the private capital has reached a sufficient concentration, part of the investment projects in question – separately or in shareholding collaboration – are due to it. But even in the most advanced of them the creation of the big infrastructure and new industrial objects happens with the direct interference, incl. investment one, of the state. The economic history of most of the countries shows that such huge infrastructures like railway networks and communication systems, ports and big channels, mountain passages and highways are built mostly by the state.

Therefore compared with the first stage, the new in principle opportunities for the industrial effectiveness of the second one seized to realize in the former exclusively self-initiative way of the firms. The state interferes with substantially new and expanding functions for their use. It more and more reaches the role of a main subject and a guarantor of the *macro*economic effectiveness and competitiveness. The theoretical need for reconsidering its economic role and the need for a new type of industrial policy emerges.

In this second stage is revealed again, and therefore confirmed, a rule, having the power of a *general principle*: as in the initial stage of the industrial development the branches with highest sensitivity to new technologies – in this case mostly the processing and at first place the machine-building, begin to dominate, after which they turn into *macro structure determining*. They play also the role, despite the barriers for competition, of an incubator base for generating and diffusion of the new technological inventions in the *whole* economy, and from there of the considerably most powerful stimulator for development of the fundamental and applied sciences. Thus the more private questions of the effectiveness in the structure determining branches become to a big extent key ones for solving the general problems of the economic growth and competitiveness not only by the private sector, but also to an increasing extent through the industrial policy of the state. Exactly this principle will further determine the main directions, priorities and focuses of *each* productive industrial policy. The algorithm of the task is one and the same – substantially new structure determining branches and technologies obligatory become *priority* object of the direct or indirect initiatives of the state; the branches of the past, which have been priority earlier, remain an object of direct or indirect support from the state only when they continue to keep a real functional role for the effectiveness of the others.

During the whole second stage a constant, even though in accordance with the changed historical economic conditions, macro initiative of the state is the support with its instruments of the permanent fight for conquering more favorable markets and cheaper sources of resources by the private domestic producers. But unlike the first stage, it already starts to participate more widely with direct and indirect initiatives for development of the *innovation and scientific activities* as factors of the industrial effectiveness and the successful competitive fight of the firms especially on the international market. Normative rules protecting the intellectual ownership as a condition for correct competition appear for the first time in the economic legislation. Added are laws, which create *more complex preferential conditions* for expanding the R&D activity of the private sector. The state itself already organizes, through its newly established institutions, fundamental and applied scientific studies as well as experimental construction works at national level. Together with the state universities and laboratories exactly in this period appear for a first time as the so-called innovation incubators, organized by the state special banks for crediting the risky R&D activity, state scientific-technical councils for contest filter of projects, high-tech centers and

parks, different mixed capital companies with state participation for covering, but also using the results from the risk projects. An object of priority attention and intensive development by the state in almost each country is the scientific-innovation activities in the military industry. The state increasingly takes care for the development of education, which is to insure an adequate quality and structure of the human capital for the perspective development of the R&D activities.

Concerning the necessary mezo- and macro-structural agreement and mutual development of the many differentiating productions (networks) as one of the increasing potential opportunities for increasing the economic effectiveness, during the whole second stage it continues to be executed mainly through the classical market mechanism and the preliminary direct contracting. But after the Big Depression and especially after the emerging of the developed countries in the second half of the 20-th century, the state expands its direct interference also in this direction. This is the time of the end of the extensive process of industrialization in *the whole economy* as an obligatory premise for sufficient competitiveness on the domestic and international market. Till then, together with the extensive directions undoubtedly also intensive (qualitative) processes based on the scientific-technical inventions have developed. But even applied mostly on separate aspects and concrete processes of the industrial activity, it is the inventions that provoke relevant changes in the *macroeconomic* structure and respectively – policy. And as Keynes states still in the 30s, the market mechanism for distribution of the economic resources cannot anymore work effectively with them. This is the reason why in the most developed countries in the 50s, i.e. significantly before the resource-intensive epoch connected with the “cheap” nature raw materials and the “cheap” economic growth was over, begins a *wide-scale macro-structural reform* under the support of the state. It continues about a quarter of a century and ends in the 70s. Here we do not need to examine in details its specific content and character. For this case it is important to mention only the main ones.

First of all there is no doubt that the macro-structural reform in question has a primary task to adapt the delayed (more conservative) macro structure in accordance with the needs, emerging from the acquired *till then* gradual innovation-quality changes in the factors and the technological processes of the concrete industrial activity. Furthermore it is also unarguable that, in order to make successfully every next step of the structural reform, it is necessary to *forecast and project* properly in visible perspective the *whole future development of the economy* in the changing foreign economic conditions. But the practical experience itself shows that such big substantially new task is already not in the power only of the classical market mechanism with its traditional microeconomic forecasting and planning based on the horizontal preliminary iterations and market-price contracting. Therefore despite the intellectual opposition of the neoclassical doctrine in the face of, for example, the political philosophy of Fr. fon Hayek and the monetaristic ideas of M. Freedman in the 50s-70s, as a *main subject* of the macro structural reforms starts to impose the state. The definite way, in which this imposing happens in most of the countries, is one of the reasons for the limited

considering and equalizing by many economists of the industrial policy only with the structural reform.

Because of the still considerably long-term capital turnover, especially in the executing and introducing in exploitation of the big investment projects, the state in part of the market countries in the middle of the XX century introduces on the example of the countries from the Soviet block the practice of the macroeconomic forecasting and even *the elements of the direct state planning*. In many of these countries the high administration has on this base a direct control and restrictions on the prices of the firms, sets direct customs and non-customs barriers as well as general non-economic forbiddances. It also gives selectively directed budget subsidies, non-interest credits, it signs favorable contracts for state orders, etc. This concerns to highest degree Japan and France. Their experience is followed later by South Korea and other pacific countries from the new industrial wave. Even countries with traditional conservative values in the economic and social-political life like England and USA start in the 50s and 60s to make *long-term forecasts* and over-institutional plan-programs with *obligatory character* concerning many basic macroeconomic indexes and different priority industrial sectors.

Just ended the first macro structural reforms, in most of the economies in the 70s and mostly among the "petrol shocks" appear again considerable macro structural tensions. They require continuing of the process of the reforms. (This is the reason the term reform more and more often to enter in the political and economic vocabulary despite its principle incompatibility with the orthodox market terminology.) But the used till then methods of the direct planning have already fully proven their inefficiency in the changed conditions, because of which they are totally neglected. This means that the increasingly expanding innovation processes in the economy of the different countries and in the world have provoked *substantially new* realities and problems. The last are evidence that the just now ended macro structural reforms and mostly the applied in them state technology have actually only partly solved their main task. Especially in perspective plan the reforms do not prevent and even more – they even do not anticipate in the process of their projecting the soon appearance of resource-energy crisis.

The often-appearing macro structural tensions and mostly the character of the crisis also show that the specific for the second stage of the resource-intensive epoch opportunities for increasing the effectiveness and competitiveness are already over. This concerns also the whole resource-intensive epoch. In its continuous period the new knowledge and technologies are really developed as a substantial factor of the effectiveness. Especially in the last few decades they acquire unreachable till then weight in the arsenal of the economic competition and progress. And still till about the 80s they have not yet imposed themselves as *the decisive track* of the competition battle. In reality to that limit of the world economic development, when higher profit and respectively growth can be still realized through acquiring and receiving cheaper raw materials, energy and labor, the innovation on their saving, respectively more intensive use, will remain *the second*

in significance direction and factor in the economic race. In the whole former resource-intensive epoch the competition really forces the agents to develop the quality of the economic activity on the basis of the new knowledge. But the known criterion for the industrial progress in its whole period actually is the *quantitative* dimension of the created material wealth. The quantity of produced gross product, as a function of the profit, remains the determining indicator for the social wealth. That is why the main directions and instruments of the industrial policy in the resource-intensive epoch are pre-determined mostly by the specific tasks on its increase on micro and macro level.

Besides, the industrial activity in the examined period turns into massive one due to the mechanization. But the machine technologies, developed only according to the classical criterion of the profit, lead the mass production and respectively the mass use of the non-recoverable nature resources towards their ending. Or the character and the extent of the use of the nature resources in the whole resource-intensive epoch have no real limitations from the point of view their eventual irrevocability, the interests of the future generations, the consequences for the nature environment. And besides as global, these problems will later impose also as *specific direct dimensions of the narrower problems about the level and dynamics of the economic development itself in every country*. At the same time for their successful solving will be already needed sufficiently developed and mostly complex, i.e. *inter-disciplinary* studies, knowledge and innovations.

Or during the whole resource-intensive epoch its industrial organization and state policy treat considerably *limited* and unrecoverable nature resources as actually *unlimited*. That is why the different concrete opportunities that such way of exploitation gives to the competing producers remain till the end of the epoch the dominated direction of their competition battle in national and international aspect. This is the main reason it to be identified as *resource-intensive*.

The resource-energy crisis in the 70s provoked a radical reconsideration of the elemental and rude consumer use of the planet resources. It set in the agenda the necessity of substantially new social-economic paradigm and model of development. First, in the new model it is necessary the resources to be treated as what they are in reality, i.e. limited. Second, in it in first plan as decisive factor for increasing the economic effectiveness and competitiveness from all levels is outlined the necessity for *intensive development and applying the knowledge about the nature, economy and society*. From now on the economic dynamics will depend mostly on the generating of the necessary knowledge and on the intensity of the *innovation activity* in all processes, links and dimensions of the economic, social, political and ecological nature, having direct or indirect relation to the effectiveness of the use of the nature resources. But such point of view and model for development could not be realized without the relevantly *wider active role* of the state and the civil society. As the contemporary experience in the leading countries shows, the substantially new in this role is the all over turning to complex long-term initiatives and programs of the state, the heart in which is the sets of strategic

measures for *maximal possible and purposeful* development of the education, science and innovation activity in the whole social-economic organism. *That is why countries, which do not reconstruct totally their development on the basis of such strategy, are doomed to increased historical delay.*

As far as the concrete content of the new industrial policy is concerned, the first most important practical measure, which could lead to a real turn in the necessary direction, is the state to expand the range of the obligatory measurers of the economic development according to: a) the limitation and irretrievability of the nature resources; b) the negative consequences for the environment and the costs on its restoring; c) the interests of the future generations in the land; d) the gross costs of the society and the firms for relevant increasing education, R&D; e) long-term major parameters of the sustainable social-economic development.

The Beginning of the Science-Intensive Epoch

Based on the technology and experience from the second stage of the resource-intensive industrial epoch at first in the big developed countries appeared, *already began to dominate and to a great extent became macro structure determining* the modern branches of the chemical, biotechnological and pharmaceutical productions, electrotechnics, automobile building, electronics, informatics, airplane building, equipment building, atom and space industries… Unlike the leading structure determining sectors in the first and second stage of the resource-intensive epoch, the useful properties of the newly created goods in these branches are totally separated from the nature qualities of the input resource. In them are put the newly created materials with unreachable till then useful effect, totally a result of the innovation activity. Concerning the conventional productions the new branches are outlined as substantially another (high-tech) model of economy with principle new technologies and inter-firm interaction.

But the *determining* characteristic for the new industrial stage and respectively epoch is that the new technological level in the *structure-determining* sectors not only favors but also increasingly imposes the need for adequate quality changes *in all the other* profiled activities, links and sectors, with which they are integrated in production-trade links. More, their substantially new characteristic already insistently requires new type of functional interaction and organizing in *macroeconomic and mega-scale*. In its practical expanding and its unlimited qualitative development is hiding a huge potential for the economic effectiveness and progress, since in the increasing globalization, integration and economic dynamics the processes of change in the concrete activities remain more closely interdependent. Therefore, besides the high technologies in each concrete activity, a *substantially new potential direction* for the economic effectiveness and competitiveness in the new epoch is the organization and high-technological innovations for *higher communicative and functional interaction* in wider and wider scale.

In the conditions of increasing economic integration an increasing role for the needs of every investment project acquires the execution of sufficiently in range, horizon and quality forecast-program activity concerning the expected

changes, as well as of *timely preparation* of the main factors and conditions, on which directly or indirectly depends the investment-economic effectiveness. Or in the new reality the effectiveness of a different project, concrete activity and sector more and more depends on the quality of the factors and conditions, pre-determining the effectiveness of the *whole* economic activity in the certain country and in the world economy and vise versa.

Therefore together with the qualitative development of all concrete activities, factors and conditions, an increasing weight for the effectiveness acquires the adequate development of the methods, algorithms and instruments for *macroeconomic* forecasting and programming towards an increasing range, poli-variants, long-term plan and reliability. Thus the practical realization of the focuses for priority development of the "branches of the future" by the leading countries in the 90s actually does not mean fragmentary sector or one-aspect functional strategic policy. Since the final goal is achieving higher effectiveness not only of the priority sectors but also of the whole economic activity in long-term horizon, the desire is to form respectively quality, optimal dynamic macrostructure and complementarity of *all* interrelated activities, and from there – a maximum possible in the changing international and domestic concrete conditions long-term economic growth. The adequate service and effective following of such strategy and policy in reality require an *increasingly holistic* view, approach and algorithms for solving the problems of the long-term development of the *whole economy* in the globalizing economic, political and ecological environment of the world. (Even though extremely difficult, the creation of an adequate forecast-program apparatus in such scale is inevitable.) In more details, the holistic approach requires organized and purposeful efforts by every state administration towards dynamic situating (structuring and development) of the priority branches in the whole economic system, as well as of the latter in the dynamic mega-environment. But for this purpose all countries will be forced increasingly to create first, the necessary *scientific* infrastructure, institutional organization, mechanisms and instruments for permanent identification of the global tendencies in the world development and of the changes in the nature environment. Second, they will have to find in the conditions of the globalizing integration more and more precise solutions of the constantly open problem for scenario forecasting and for the choice of the best alternative (trajectory) for their long-term development in the changing world realities. Third, the countries also must all the time actualize in the frames of the chosen trajectory and follow a national strategy, which remains or improves their competitive positions. Fourth, with analog foresight, continuation and persistence they should project and *prepare in the present* the most important prerequisites, conditions and factors of the growth, through which is insured the *tomorrow* dynamic complexity and harmonic development of the whole economic activity in long-term plan.

Practically all these strategic tasks concern the active forming, under the leading patronage of the state, of dynamically effective *macroeconomic structure and infrastructure* according to the changing global environment and tendencies. Or the long-term forecasting, optimizing and indirectly regulating role of the state in

the use of such powerful direction for increasing the economic effectiveness and dynamics in the new epoch is decisive and practically without alternatives.

For part of the advanced countries the necessity for macroeconomic forecasting and strategic economic policy in the 90s continued to be realized by the state in the form of *considerably separate* macroeconomic programs for priority development of the most perspective sectors, activities and communications. In another part of the countries this necessity is realized in the form of indicative (alternative to the former directive) planning. But the desire in both of them is through the activity of the relevant state institutions to be revealed and realized the best possible in the reached stage long-term perspectives for the competitiveness of the *whole* economy mainly through the *primary* factor of the contemporary development – the complex peak knowledge of the nature, technical and social-economic processes. Therefore even though still with different approach, the main directions and instruments for carrying out their long-term industrial policy *begin practically to equalize*. They change towards substantially new, more complex and more unified worldview, approach and model of economic development.

But still the dominating part of the concrete content of their long-term policies in general cannot be equal. Since their purpose is exactly to insure competitive advantages of the *national industry*, the differences in each country will continue to base on two major "whales":

- Profiling, establishing and realizing in the world economic space a long-term state strategy according to the national advantages of resourceful, geographical, political and culture-intellectual nature. Of course they should be preliminary really outlined.
- Together with the full use of the available foreign innovation achievements, especially after the final entering in the science-intensive epoch – massive qualitative development of *all* activities, sectors and interrelations based on more intensive generating and using by the competitive economies of *original* innovative achievements.

Or shortly, the decisive key in the competitive battle for eventual catching up of the best as well as for keeping the already won leading positions can be formulated as: a *complex long-term national strategy*, realized through such investment-innovation policy of the state, which maximally intensifies in the concrete conditions the purposeful development of the science and technology in order to create and use *more original innovation decisions* than the competitors. This formula contents respectively the regulated by the state impact on the development not only of the science and technology but implicitly of any other functionally connected with them specific social area. But the formula should be added with the definite explaining in it of what became after the entering the science-intensive epoch a primary factor of the economic development – *scientific-education activity*. Too indicative for the role of this factor in the contemporary competitive battle and growth of each economy are the announced in 1995 six major principles of the scientific-technological policy of the administration of Bill

Clinton. Because of the pilot role of the American industry compared to the others, it is reasonable to accept that these principles *have in fact a unified significance*:

- The science and technologies are basic determinants of the American economy and the quality of life.
- The state support of the scientific activity and technologies should be considered as an investment to the future. At competitive level the federal investments in the science and technologies are vitally important for the future of the American society.
- The education and improving of the qualification in the science and technology are basic factors for the future of USA.
- The federal government is obliged to play more and more significant role in the establishing of the new national standards of the education, in the encouraging career choice by the young people in the field of the science and technology.
- It must continue to support strong scientific institutes – universities, research centers and national laboratories as part of the national scientific-technical infrastructure.
- The portfolio of the federal investments in the science and technology should range not only the fundamental, but also the applied studies, incl. the technological studies at pre-competitive level, made by the state together with the private sector in favor of the all-national interests.
- The stability of the invested capitals, based on a long-term planning, is an extremely important factor for the effectiveness and productive use of the federal investments in the studies and connected with them areas of the education and the international cooperation.

Or having in mind the mentioned principles, the formula should be defined in the following way: *the decisive factor* in the competitive battle is the nationally profiled, *front* active *scientific-technological* and *educational-qualifying* policy, providing conditions for maximal fast economic growth based on *original* scientific-technological breaks-through. But in this form it also does not include all essential factors of the contemporary competitive development.

The increasing globalization and interdependence of the economic processes in the last 1-2 decades with the same intensity ranges also the *social-political* processes. According to this interdependence the solving of a certain economic problem today is to a great extent also a solving of the relevant problem in the social and political area. And on the contrary, the solving of the problems in the social and political area, its new actively formed qualitative state and stability more and more turn from indirect into a direct factor of the economic effectiveness, stability and development. Therefore in the whole scientific and innovation activity on the solving of these interrelated problems in the foreground nowadays outlines the primary role of the *social sciences*. On their coordinated and purposeful development in the utilitarian direction further directly will depend the social-economic growth of each country in the new epoch. But at the same time it is necessary specially to be stated that the practical solving of the economic, social

and political problems in macro- and mega-scale *still* continues to be made mostly in one-side export and pragmatically political way. The main reason for this increasing paradox hides not so much in the extreme complexity of the social-economic problems, but in the prejudiced influence of the dominated till now society paradigms. Exactly this paradox is the deepest basis for permanently today in the world emerging crises of different nature and for the still insufficient capability of the international institutions they to be forecasted and overcome. But the increasingly integrated and dynamic world economy more and more difficult allows to be developed sufficiently realistic long-term forecasts and programs for development of what-so-ever character through self-separating for the relevant priority area approach. The world and the countries today are not only closely interrelated. They have become to a great extent a unified economic and political space. It already insistently needs complex *interdisciplinary* studies, knowledge, innovations and project decisions.

Therefore the adequate response to the new challenges by the social sciences is yet forthcoming. Only as an illustration it can be mentioned that one of the main interrelated problems of interdisciplinary character, for example, is the finding and practical following in each country (through relevantly established institutional system) of those commonly valid, principle limits in a depolicized distribution of incomes, which first, insure sustainable dynamic equilibrium in the development of the economic system; second, harmonize the main economic and social interests, due to which provoke social peace; third, they are a basis for a political stability; fourth, they serve the necessary for the social and political stability new standard of life; fifth, through relevant education and science policy of the state in time form such quantity, quality and structure of the human capital, which have already turned into the decisive factor of a sustainable social-economic development.

As far as each of the production-trade networks today ranges a wide profile of activities, the high technological changes in the combination of networks already practically influence the development of the dominating part of the economy of the most advanced countries. The intensity of the process imposes the conclusion that the substantially new realities soon will range throughout the whole economy. Probably because of this reason a new term “knowledge based economy” appeared in the scientific language of the developed countries. Even though it intuitively marks only the beginning of a new global economic model, the term actually is to a great extent an emblematic characteristic of the whole science-intensive epoch, which industrial development entered.

Today none of the economies in the world is totally based on the knowledge. But even when high technologies conquer all concrete activities, incl. the traditional economy, this will not be sufficient for it to be called totally knowledge based economy. Most generally there will be such economy, when based on well developed interdisciplinary knowledge of the nature, society and the global character of the economic-political processes, which satisfactory will solve all interrelated main problems of the effectiveness and the sustainable social-

economic development through *sufficiently* holistic approaches, algorithms and instruments. If this turns into a practical reality, then there will be really to great extent knowledge based economy. But within the increasing integrity in the new model of development between social-political and economic processes, this at the same time will mean also in the relevant extent a presence of *knowledge based society*. In such case there is a logical reason to assume that the last term will turn into the key term of the social sciences in the 21-st century.

A Short but Fundamental Conclusion for Bulgaria

In the wide context of the so far drawn before the country global tendency, two main historical alternatives objectively exist. One of them is the previous one from the beginning of the transition – the carrying out of reforms without sufficiently clear historical perspective and projection in the dynamic development of the world integration process and economic networks; without strategic goals coming from the perspective; with tenaciously restrictive instead of purposefully active scientific, educational and innovation policy; based on philosophy, approaches and instruments, which in reality are from the past of the market economy. The further following of this alternative can be compared to the behavior of the crab – a desire to walk forward with intentions and eyes turned backwards. Following such an alternative in the future, the scissors between the front echelon of the industrial countries, determining the standards of the globalizing economic competition, and the really achieved ones in Bulgaria will inevitably open, with the difference in the speed between the space rockets from the 21-st century and the steam engine from the first half of the 20-th century.

The other is provoked by the contemporary challenges and imperatives of the global industrial tendency (regularity). As we tried to show, the adequate answer to these challenges is the radical restructuring of the state policy in direction to strategically programmed social-economic development. The edge of such strategy and policy is the *priority opening of the decisive factor of the contemporary competitiveness – strictly purposeful in long-term horizon scientific-educational and innovative activity*. Only such similar alternative approaches give a real chance for a gradual approaching of the world competitive standards and in particular the economic criteria of the European Union (EU).

After starting the negotiations for integrating Bulgaria in the EU this second historical alternative seems like turning into practically non-alternative. And really there is no doubt that in the long process of the negotiations, even only because of outside pressure, a significant part of the substantial attributes of the contemporary competitive economy will be created. To a greatest degree this concerns the institutional-legislative system. But now, at the end of the finished (according to the official estimates) transition and in the beginning of the negotiations, the fundamental question still remains open: are there real symptoms that the state governance of the country already has the necessary intention and readiness for a determined turn in its economic policy towards complex consecutive forming also of the other main elements of the contemporary competitive economy?

In the spirit of the exposed so far considerations only one substantial fact from the publicly announced official intentions in 1999 is in support of the positive answer: the announcement that a national strategy for development of the high technologies is prepared. But even this fact is not an adequate argument for the positive answer. First, because the strategy is not an organic part of a complex long-term national strategy for development, as such is not made so far at all. Second, it does not correspond obligatorily with a package of long-term measures for development of preliminary outlined as priority perspective sectors of the economy, since "the active sector policy" in general is not let into the economic philosophy of the last state governance. Third, instead of being functionally interrelated to the corresponding active state policy for purposeful development of the scientific-educational activity, the latter on the contrary continues to be treated in the state budget for 2000 as one of the marginal and without practical significance factors of the economic development.

The fundamental conclusion for Bulgaria imposes by itself. In the beginning of the 21-st century, when the competitive countries develop increasingly based on the high knowledge and technologies in wider and wider areas of the social-economic life, the country in reality continues on the old track of the chosen so far historical alternative. But this track dooms it to progressive delay from the world competitive standards as well as from the criteria in the economic space of EU, towards which it strives.

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