

Upgrading of Territorial Systems in the Innovative Paradigm of Economic Geography

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Abstract

Factors that influence an innovative model of economic development of the world's regions as well as conditions that favor the implementation of knowledge and innovations of the forming transnational corporations in the particular area of the world are considered in this article. Special attention is paid to the globalization of industrial activities of transnational corporations. Competitive factors which led to the success of countries' and regions' scientific and technological policies are assessed.

Key words: transnational corporation; technological policy; innovations; globalization.

JEL Classification: F6, L5, O4.

1 Introduction

The innovative development model of economy is a notion which is widely used by the political elites to define directions, set goals and tasks for the future social and economic development of the country. The innovative development implies the mobilization of intellectual, financial, human, technological and other resources for attainment or retention of favorable position in the growing segments of the world market. The country's share extension on so-called dynamic markets enables to get the additional resources for stimulating the growth of the whole economy externally, allows to modernize economic patterns and to develop infrastructure. Therefore, technological innovations are perceived as a general solution to the problems connected with the growth of the country's competitiveness and overcoming socioeconomic obsolescence. In the industrialized and some developing countries the state strongly supports strategies for the innovative development. The state stimulates the development of the academic field of the country and creates conditions for establishing the so-called "innovative clusters" or "innovative regions" by expanding the infrastructure. This implies that there are regions with the high centralization of high-tech companies, high patent activity (compared to other regions), high level of contributions to R&D, employment rate in high-tech industries, a large share of high technology products in the export structure. The majority of these regions are located in the industrialized countries. For instance, there are such regions as "Silicon Valley" in the USA, which is named as "a unique ecosystem"¹ by the professor of Stanford University V. Miller. Among such regions there are Stuttgart agglomeration, Île-de-France region, Greater Tokyo Area, Seoul, Singapore, etc. These

¹ «Das verlorene Vertrauen» // Stuttgarter Zeitung. № 5. 8.01.2014

regions have become the centers of global innovations, and the majority of the world's new technological ideas are born there. In some developing countries great attention is given to the formation of high-tech growth poles (such as innovative regions and regional clusters). In contrast to developed countries the formation of such systems just on the basis of inner resources in the majority of developing countries is impossible. The policy of catching-up development requires contemporary new knowledge which is concentrated in particular regions of industrialized countries due to historical events. Main innovative resources and the newest world knowledge are concentrated in the innovative regions. Big transnational corporations are the carriers of this knowledge. On the contrary, globalization of transnational corporations' productive activities enables less developed states to get an access to new knowledge and technologies, adapt and directly use them in their regional systems. Certain regions of the developing countries get a chance to start a new cycle of transformational growth. Global production networks are the channel through which the transfer of new knowledge and technological know-how from innovative regions of the developed countries to the emerging innovative regions of developing countries occur. In addition, in most cases the "global players" stimulate the processes of regional learning, which reflect the functional complexity and the development of socio-territorial system.

2 Body of Paper

Transnational corporations as a factor of innovative development of territories

Globalization of the world economy takes place under the sign of the economic activities of large transnational corporations. Liberalization of the world trade, the introduction of new technologies and relatively cheap fuel resources allow transnational corporations to use the advantages of the location of certain territories which are sometimes situated at a considerable distance from their home country. Putting the individual stages of the production chain in the most convenient places, companies save a lot by reducing factor costs. At the same time new models of cargo transportation and modern logistics make the production of goods profitable in a geographically fragmented production chain. Thus, global production networks are formed. Today, they account for 80% of the world trade (due to the World Investment Report, P.10). They cover the whole cycle of value creation of a product from raw material extraction and production, to sales and disposal (due to Paul L., Knox P., Sallie. A.).

The development of production networks goes in two ways. First, the growth of international competition forces companies to specialize only in those areas that can provide the greatest competitive advantages. Concentrating resources on strategic operations (management, R & D, control), the companies refuse from less important functions in their understanding, taking them into the competence of other companies that have cooperative relations with the first type of companies. This phenomenon has been named as "outsourcing" in the scientific literature. As a result, the share of the parent companies in the value of the final product is reducing. The biggest part of the produced total cost of the product is given to the competence of regional and international partners.

The second way is the partial transfer of production or service functions to the other regions of the world (which is called "offshoring"). Using spatial differences (natural, economic, social, and humanitarian) of the world regions, international companies achieve the greatest efficiency in terms of the revenue growth and cost reduction. In addition, not only the factor

costs are the main motive of the production internationalization, but the access to the regional market and technological know-how (knowledge) play an equally important role.

More and more companies are getting involved in the processes of internationalization of the production. It is roughly estimated that at the beginning of 2008 there were 82 thousand of transnational corporations in the world (whereas in 1990 there were 7 thousand) and 810 thousand of their branches situated worldwide (according to Rodionova I.A.). Communication and logistics networks of the companies seal the whole world. Their configuration is the result of companies' financial investments abroad, their management and states' performance in the process of marketing of their regions. Networks modify functions and roles of countries in the international division of labor. Recent years have been marked with the increase of developing countries in the world share of industrial production (according to Rodionova I.A.). Functionally, developing countries are more and more deviating from the suppliers of raw materials and agricultural products. They are transforming into industrial and service areas of big international companies. In some companies the processes of formation of innovative parts of independent high-tech activities are observed. However, generally, R&D, strategic management, administration and control of logistics chain remain as a prerogative of industrialized countries.

The global division of labour in the production network is a strategic factor in improving the competitiveness of the company. Due to the distribution of production and service functions (global sourcing) at the planetary scale multinational companies lower their own costs and financial risks, sharing them with other companies. Cheap labor and low factor costs in the developing countries help in transfer manufacturing and service operations to them. Saved resources are directed for the creation and development of new products and realization of marketing strategies by the parent or main company (lead firms). Thus, in forming final cost of production the share of R & D, advertising, logistics, located on the territory of the developed countries increases and, simultaneously, the share of direct production, localized in developing countries reduces.

Three main stages can be marked in the history of the postwar internationalization of factory area networks. In the period of 1950-1990-s branches with high material and labor costs, which were included in a group of low-tech branches, were in the centre of global sourcing. Among first industrial branches which were exposed to the processes of internationalization there were extraction of raw materials and after that textile, clothing and footwear industries. A number of employees just in textile industry of Germany reduced in 8 times in 1991-2009 (from 400 thousand to 50 thousand people). Later medium-tech branches (such as automobile industry, mechanical engineering, electrical engineering), which require certain experience from factory workers, were drawn into global sourcing.

Since the beginning of the year 2000 trends in increasing internationalization of not only medium-technology industries, but also high-tech industries and a number of intelligent services could be observed. Electronic industry, production of computers, communication equipment have become leading branches in a number of developing countries. At the same time the service activity is moving to new places. The term "service offshoring" is understood as the "take-away" of serving functions of enterprises to other countries and regions. They can be transferred to other independent companies (offshore outsourcing), or performed in foreign centers of the parent company (captive offshoring). Services can be provided in the regions situated nearby to the "centre", such as Eastern Europe, Mexico (nearshoring), or in relatively remote regions (India, China, and Latin America).

During the internationalization of productive activities more and more new activities are getting included in offshoring. They are oriented on the humanitarian opportunities. The creation of new manufacturing lines of big transnational corporations situated in the countries of Western Europe (such as "GM", "IBM", "Novartis", etc.) in India and China occurred simultaneously with the creation of numerous research centers and R&D laboratories there. Besides, transnational corporations stimulate processes of education and organization of network-wide exchange in the regions of their placement. First of all, it happens by targeted training, advanced professional training of staff for the benefits of a lead firm. Secondly, it happens during the process of studying in the formal cooperation with other companies, regional organizations, mainly with contracting companies, suppliers of products for a lead firm. In this case adaptation of technologies and forms of labor organization, derived from a lead firm, takes place. Also companies work in close cooperation with regional universities and national research centers. Initially the transfer of knowledge goes from companies to the scientific and educational institutions. Later on in a form of skilled professionals it goes backward (due to Fromhold-Eisbith M., P. 91). Moreover, it goes along with the process of education through imitation. Geographical proximity of companies contributes to the copying of leading forms of labor organization and manufacturing. Imitation of activities encourages rise of chances for regional companies to survive. The experience of Chinese companies connected with imitation of technologies and production of western companies seems to be attractive (due to Liefner I.).

The growth of technological status of a regional system (upgrading) occurs through the integration of local qualified personnel in research processes of the companies. The activities of the American company Intel is a good example. With production offices in Malaysia and Costa Rica, the company actively initiates, by engaging in innovative activities (since 2000 having its own laboratory) regional researchers and engineers, as well as programs for R & D funding in the regional universities, the creation in these countries of the global IT clusters. In Costa Rica, for example, the diffusion of global know-how, using the method of formal and informal exchange of knowledge corporate experts with representatives of local companies in the national ICT sector, is stimulated. The knowledge transfer is also going due to the creation of new firms by former employees of American companies (spinn-off). Because of this the overall competitive position of local firms is growing. Some of them conduct independent research and development. The researchers indicate the formation of one of the most progressive protoclusters of Latin America in the ICT industry in Costa Rica (due to Stamm A., P. 102).

In Malaysia, the company "Intel" is conducting pilot tests of the new processors, developed at the research center in Austin (USA). Here, on the base of the factory, the R & D center able to test, adapt and improve products was organized. This required the involvement of highly qualified local specialists and the establishment of cooperation with the competent companies-contractors. The resulting spin of the effects and the influx of new companies in the technology cluster is by far the largest in Malaysia (Penang). A number of suppliers due to the collaboration and cooperation with the parent company in a short time became transnational corporations (Altenburg T.). This is reflected in the rising share of high-tech, sophisticated production facilities and services in the export structure of these countries. As indicated in Table 1, in 2010 exports of Malaysia and Costa Rica's leading position was occupied by the products of the so-called "developed" (sophisticated manufacturing), high-tech industries that puts these countries in the list of the world leaders.

Tab. 1 The share of production and services due to the level of complexity in the structure of export of certain countries in 2010 (%)

Countries	Raw materials	Low-tech production	Middle-tech production	High-tech production	Intelligent services
Brazil	60	5	15	5	10
China	10	25	20	30	5
Costa Rica	20	5	5	35	15
India	35	15	10	5	25
Malaysia	30	10	15	30	5
Russia	75	5	10	0	5

Resource: World Investment Report, P. 201

Noteworthy is the fact that in 1995 the share of raw materials in the export structure of Costa Rica approached 70%, and the share of high-tech production did not exceed 3%. Over the past years, the country was able to enter the new stage of technological development, indicating, thereby, to other states on possible solutions to problems of technological and socio-economic backwardness (World Investment Report, P. 202). Positive changes in the territorial development through technological transfer and knowledge are also observed in China, India, and Brazil.

Thus, the technological regional transformations have become possible by the initiation of interactive learning processes even by the one large global company. It can be assumed that such processes will be strengthened if in the region dozens, hundreds of global players operate. This can be traced in the Indian city of Bangalore.

Today, Bangalore is a major centre of information technology of the country and the strategic location for many foreign companies. In 2010 more than 1100 of transnational corporations, among which we can highlight the "Intel", "IBM", "Dell", "SAP", "Cisco Systems" "Oracle" "HP" "Bosch" and several other major corporations ran their businesses. In addition such large Indian companies in the IT industry as "Infosys", "Wipro" were founded. In the city the ICT sector employs more than 250 thousand people (more than in the U.S. Silicon valley). It produces 90% of computer programs exported out of India, a large proportion of the products of the national biotechnological sector.

A number of factors contributed to the transformation of the national centre for the technology in global innovation location. Firstly, due to the high concentration of specialists in the field of information technology in Bangalore the city became the main place to solve the issue of 2000s years for American and British companies (issue of transition of computer systems in the new Millennium). In the 1990s, the Indian companies worked intensively on the orders of hundreds of foreign companies. The success of Indian firms was not only in the accumulation of capital, experience and know-how, but also demonstrated the viability of a new model of international division of labor in high-tech industries. Moreover, it stimulated the further inflow of orders in Bangalore. Not only IT services, but also services to the private sector (BPO), call centers have become common here. International companies started to open its subsidiaries in the city, involving the work of local workers.

Secondly, the crisis of the high-tech sector in 2001 caused remigration of laid-off workers of the Indian origin from the high-tech sectors of industrial countries. Most of them worked in the 1990s at the enterprises of Californian Silicon valley and advanced knowledge, experience in Western companies. An important role was also played by the development of the communication infrastructure of the city. The access to the high-speed Internet and phone connection have created conditions for executing orders from other regions in real time and

effective participation in various forms of offshoring. This period was noted in Bangalore (as in the whole India) by high-growth information technological sector, while in the whole world recession was observed (due to Fromhold-Eisbith M.). Thus, the integration of the region Bangalore in the global production (service) network was carried out in two ways: expensive outsourcing services to Western companies, the transfer of some functions of the regional companies or subsidiaries of the parent company to the region, but also in the form of a return (inflow) into the region the Indian programmers and other professionals with experience in foreign high-tech companies and the "baggage" of excellence from other countries.

The state scientific and technological policy aimed at the development and modernization of high-tech industries has also contributed to the development of the innovation sector of Bangalore. Since the late 1980s the government has given special attention to the development of the information technology sector, seeing it as the basis for further economic growth. For these purposes state agencies have conducted systematic recruitment of large foreign companies to attract them to work in the country. At the same time national sector was developed rapidly. One of the central mechanisms of this policy was the construction of technological parks with preferential taxation. In Bangalore such large parks as the International Tech Park and the "Electronic city" were built. Another mechanism of stimulation of innovative development of the country was the creation of a modern, competitive system of education that could prepare professionals for national and foreign companies. The state purposefully supports educational and scientific activities of elite higher education institutions (e.g., Indian Institute of technology), encourages the cooperation of universities and companies of the business sector. In reforming of education foreign companies also play an important role. In regions with large public research centers good relations between them and transnational corporations have been established, concerning, first of all, training and research activities. In the early 1990s, foreign companies took part in the discussion of the curricula of universities, conducting joint research and development. This contributed to the raising of the level of education in Indian universities. Today, the level of training at the technical faculties of the country, their qualification is not inferior to that of industrialized countries (due to Kämpf T.).

Strengthening the national innovation system was going in parallel with the growth of interactive learning processes in the region, constant increase in the level of objectives run by companies. Thus, in early 2000, the majority of companies in the information technology sector were engaged in the creation of computer programs. The next step was to guide the IT managers of the customers, IT management system of the production network. Also industrial enterprises of the city have undergone phase from Fordist production and test products prior to the period of the organization's own R & D and production of new products. In the region a real innovation boom is being observed, when about 90% based in it IT companies conduct their own R & D (due to Fromhold-Eisbith M., P. 91).

The rapid growth in the first decade of the twentieth century was demonstrated by the Indian companies in the region. In "Infosys" the number of employed increased in the period 2001-2007, more than 7 times (from 9.8 to 70 thousand people), Wipro 6.6 times (from 9.9 to 66 thousand) (Kämpf T., P. 53). The company Tata Consultancy Service for a short period of time has become one of the world's largest companies providing it services. With the number of employed 84 thousand (in 2001, 13 thousand people) it has offices in 42 countries. In the company's subsidiaries in Latin America in 2008 about 5 thousand were employed (in 2001-700 people) (due to Glückler J., P. 40).

Also foreign companies have also seen a considerable growth of employment and capital turnover in the region of Bangalore. In the Indian branches of such large companies SAP, Bosch, Daimler, Cisco, the number of employees has increased tenfold. From Bangalore economic, technological and innovative impulses began to go to the other regions of India. Significant growth of new industries is observed in Hyderabad, the Beginning, Delhi, and Kolkata. Most TNCs pursue a policy of spatial expansion in India. For example, IBM expected to increase expenditure on R & D in India in 2008-2010 to 6 billion. and to increase the number of employed up to 14 thousand people American Accenture had plans to increase the number of people employed in India 2011, up to 50 thousand people (due to Pilny K., P. 72).

3 Conclusion

Global off-shoring gives developing countries a chance to overcome their technological inferiority from developed countries and modernize their national economies. According to different studies, processes of over-complication of work in process and value added growth of manufactured products and services (Stamm A.; Schamp E.). Most companies are primarily focused on the availability of cheap workforce and they are interested in further training of their workers. The quality of output product rises and work process optimization is noted. As time passes the level of performed work in off-shore companies grows increasingly complex. It happens because growing agglomerative costs force companies to switch to manufacture of products with higher added value. Only in this case company's products will be competitive. These processes are simultaneously followed by growing integration of off-shore companies in a regional network, cooperative system with other companies as well as with universities and scientific research institutes (Demonstrative examples of Budapest, Bangalore, Shanghai) (Glückler J.; Fromhold-Eisbith M.; Liefner I.). Dynamics of these processes is possible only in the regional system which has corresponding structures and stimulates external and internal network-wide processes. Favorable state scientific and technical policy, government investments in education, science, technologies and infrastructure create conditions which are essential for manufacturing high technology products and services by foreign and national companies. The growth and amplification of off-shore activities in the regions of developing countries are practically impossible without these qualities. Structures of regional systems should support and stimulate processes of interactive training and adaption of new knowledge in the region. As labor with its technical and scientific characteristics becomes more sophisticated, the level of regional scientific and technical (innovative) system which is capable not only of adapting external knowledge (know-how), but also producing them, rises. The region evolves from the place with low factor costs of manufacturing to the high-tech strategic place of the world where the presence of global actors is no more coincidence but necessity (Kämpf T., S. 59). Therefore, cooperation of endogenous forces of regional systems with exogenous forces of the global manufacturing system can affect regional growth and development in a good way.

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