GLOBALIZATION OF INNOVATION ACTIVITY BY TRANSNATIONAL CORPORATIONS: AND ITS IMPORTANCE IN THE PRESENT ECONOMIC CRISIS

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Abstract: The research aims to investigate the process of globalizing innovation activity conducted by transnational corporations (TNCs), in a wider context of economic changes outside and inside companies. The process has been triggered by decentralization and internationalization of R&D, "creative transition" of foreign subsidiaries as well as implementing research networks and the open innovation model of TNCs' innovation activity. Under the present economic crisis some slowdown and reorientation of innovation programs are implemented in order to reduce their costs and increase effectiveness. The globalization of corporate innovation activity can contribute to reaching some of TNCs' goals both under the present crisis and the future revival of the world economy.

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Changing technological and economic conditions in the contemporary world economy have set forward innovation activity to a key arena of global competition. Due to the present financial and economic crisis, global rivalry has become even sharper. It forces transnational corporations (TNCs) and other companies to adjust and upgrade their competitive advantages, while financial means are smaller or less accessible. In such circumstances a pressure for cutting operation costs and investments of companies is inevitable. To adjust to short-term market conditions also R&D budgets, innovation programs and product development projects must be reduced. As Mr. Sam Palmisano, Chief Executive of IBM, says: "Some may be tempted to hunker down, to scale back their investment in innovation. While that might make sense during a cyclical downturn, it's a mistake when you are going through a major shift in the global economy" (Jana, 2009). So a kind of message is sent from IBM, a globally competing company. The present slowdown should be considered in a wider context of long-term transformation of the world economy under two processes - globalization and growth of the knowledge-based economy. To meet challenges of these processes, the innovation activity of TNCs should be sustained and improved in terms of its effectiveness and competitiveness.

The article attempts to answer a question: is the globalization of TNCs' innovation activity a good strategy for the present economic crisis? To answer the question it is necessary to investigate the globalization of TNCs' innovation activity as well as to find out its current changes and a potential for alleviating problems of companies under the present economic slowdown. Consequently, some remarks on the future TNCs' innovativeness are made.

The globalization process: some basic issues relating to the TNCs' innovation activity

Among various concepts of economic globalization, a widely accepted one refers to the internationalization of business activity conducted by enterprises. As stated by Dicken (1992), globalization is a more advanced and complex form of internationalization which implies a degree of functional integration of geographically dispersed activities led by firms. The globalization process has developed under a set of three groups of factors which are: economic liberalization, technological progress and international competition. The main driving force of the process - at micro-, mezo- and macroeconomic levels - is a global expansion by transnational corporations (Zorska, 2007). Changes in value-added chains, strategies, organizations and foreign expansion of this leading group of enterprises contribute to the evolution of globalization. And, on the other hand, changes in the process and the global economy can affect various activities led by TNCs.

Under the above-mentioned groups of factors, value-creating chains of TNCs have been fragmented into particular functions (e.g. R&D, design, processing, marketing), which are relocated abroad to take advantage of better economic conditions (Yip, 2002). Then they need to be integrated and coordinated across borders of countries by TNCs' headquarters. Within particular value-adding functions, specialization and fragmentation become deeper or larger, so also some parts of the functions are transferred to other countries where economic conditions are more favorable for given operations. Not only corporate foreign subsidiaries and joint ventures take part in the globalization of TNCs' value-creating systems but also independent foreign firms, usually as partners of cooperation.

Following the global spread of TNCs' value-creating chains, since the late 1990s the internationalization of corporate R&D function has got some momentum. Some research tasks tended to become more specialized, fragmented and relocated abroad, so consequently their cross-border integration and coordination has followed, both with other functions (e.g. R&D with design, processing or marketing) and within the R&D function itself. As the research activity makes an initial action in the innovation process, soon the internationalization of all corporate innovation activity has been initiated. Its further advancement leads to the global spread of innovation activity and its network organizations led by TNCs.

The globalization factors have been favorable for the innovation activity as well. The liberalization-oriented policies of governments have turned to policies enhancing international competitiveness of national enterprises and economies, with particular importance attached to science and technology, higher education, modern infrastructure, growth of innovative firms, etc. Even in less developed countries endowment in technologically advanced factors and capabilities has improved and they are accessible for both national and foreign enterprises, including TNCs. At the same time a need of enterprises for high-tech factors and capabilities has increased much as far as the international competition turned into hyper-rivalry of all firms which must work out and use much stronger competitive advantages. Creating and applying information, knowledge, new technologies and all kind of innovations have assumed the utmost importance for firms willing to compete successfully on the global market.

The present technological change and a "bundle" of information and communication technologies (ICTs) are regarded crucial factors nowadays, affecting the processes of globalization and growth of knowledge-based economy. More and more information, knowledge, technology and innovations are needed by enterprises for creating new or modernized products, business infrastructure as well as methods of production, management, organization, marketing etc. In order to make the innovation activity more effective, TNCs have turned to ICT-based outsourcing and offshoring to overseas locations with low-cost production and/or high-ranked research results. Under the forces of hyper-competition and information economy, a true global race in innovativeness of firms has been developing.

The globalization of TNCs' innovation activity means that conducting R&D and all other innovation activity is geographically dispersed, i.e. fragmented and relocated to foreign countries. For the relocation, flows of foreign direct investment (FDI) are used to set up corporate R&D centers and labs, or to expand research divisions within existing subsidiaries in foreign countries. Two other ways of tapping to overseas knowledge and innovation pools are: technological cooperation (alliances) and acquisition of technology on commercial terms (licensing). In practice, all methods of internationalizing innovation activity are used by TNCs, with temporary shifts among them. Under economic crises, FDI is usually reduced heavily while cooperation comes to a front stage.

To create value added from dispersed parts of R&D function and diversified forms of its internationalization, a cross-border integration and coordination is conducted by TNCs' headquarters. It implies global flows of information and knowledge as well as transfer of technology and innovations, with all taking forms of intra-firm and inter-firm international exchange. Coordination of the flows requires top management capabilities as well as sophisticated cross-border strategies and complex structures. But first of all it needs a good economic and political climate to reduce many risks.

For strong, global players hard times are good times to outcompete their rivals. The concept of globally integrated enterprise (Palmisano, 2006) has been brought to life by some TNCs, including IBM. Its present global spread includes not only outsourcing and offshoring to cut costs but also to tap to foreign resources of new knowledge, high skills and modern infrastructure. As a matter of fact it is not quite a new drive, as long as since the early 1990s IBM has set up labs outside the USA, namely in India, Japan, China, Israel and Switzerland. Holding a steady budget for research in 2009, recently the IBM corporation has intensified its overseas R&D investments and even more - a cooperation with partners from other countries. Despite the present crisis, IBM's new global research program has taken off (Hann, 2009). It covers R&D investment in a joint-venture laboratory in Brasil as well as six R&D or technology alliances with firms, universities or research centers in Saudi Arabia, Switzerland, China, Ireland, Taiwan and India. As the IBM Research Director says: "The world is our lab now". A similar approach to globalizing innovation activity is also applied in other TNCs, like Intel, Royal Philips, Procter and Gamble, Eli Lilly. And also some TNCs from less developed countries (China, India) follow their example and build up their global R&D programs.

Changes in the TNCs' innovation activity: towards an open innovation model

Under the processes pending in globalizing world economy, TNCs' started to expand their research programs and increase R&D expenditures throughout the 1990s. In the present decade they have become true "research powers" as far as R&D expenditures of some TNCs exceed research budgets of many countries. In a group of 50 leading "research powers" one could find 25 countries and 25 TNCs in 2002 (World Investment Report, 2005). In 2006 the highest R&D expenditures were spent by the following 10 corporations: Pfizer, Ford Motor, Johnson&Johnson, Microsoft, DaimlerChrysler, Toyota Motors, GlaxoSmithKline, Siemens, General Motors and Samsung Electronics - as a newcomer in the group. Pfizer's R&D spending reached 5.7 bln euro while other corporate "research powers" spent amounts ranging from 4.7 to 5.5 billion Euro (Francik and Kosala, 2008). All the leaders spend their R&D money and conduct research programs in the global environment.

Increasing R&D investment efforts of TNCs were accompanied by crucial changes in their innovativeness. Evolution of the corporate innovation activity started from a withdrawal of paternalistic approach and a move towards liberal one. First of all it implied more and more decentralized organization and management of the innovation activity within corporations. It was recognized that innovations could be created and applied not only in central labs (close to TNCs' headquarters) but also in research centers and subsidiaries located on foreign markets. Moreover some subsidiaries strained to upgrade their resources and capabilities what enabled them to increase own innovativeness and competitiveness, and to build up their leading position in a differentiated corporate networks (Nohria and Ghoshal, 1997). As a center of excellence, a R&D center or subsidiary can provide other corporate units with research results or innovations to be used by them for a higher value creation. Thus innovation activity has moved to leading corporate units, at the same time improving its significance, interactions and international scope (towards many foreign units and host countries).

The process of "creative transition" has started and it means increasing role of foreign subsidiaries in the TNCs' innovation activity. It consists in transition from passive fulfilling parents' tasks (e.g. technology adaptation) to active engagement in own research programs, creating new knowledge and technologies, transferring innovations to other corporate units etc. Moreover foreign subsidiaries take more responsibility for establishing contacts and cooperation contracts with local research centers, universities, innovative firms in host countries (Manolopoulos et al., 2005). Thus a new task for foreign subsidiaries has emerged which is seeking and acquiring new knowledge, technologies and innovations in the global environment. TNCs' pools of innovations can be enlarged with an inflow of new knowledge from outside their organizations, from independent entities located in many countries. The growing inflow and share of new knowledge from other entities and countries implies increasing external orientation in the TNCs' innovation activity.

As far as a diversified portfolio of knowledge items and innovations at a disposal of TNCs' has been expanding, its management becomes more and more important and complex. Coping with it successfully requires a model approach which is suitable for a given set of many conditions. A long-term evolution of innovation activity models includes transition through five models, i.e. from an early linear one towards a recent open innovation model. The opening of firm's innovation activity means expanding cooperation with other entities in order to get access to their knowledge and innovations or to conduct joint research programs. At the same time, TNCs become more prone to allow access to and outflow of their own knowledge as far as not all new results can be applied for firm's value-added creation. Thus a supply of knowledge from various entities or sources is available to firms for choosing particular inputs to be integrated and effectively applied. Thus the open innovation model is featured with geographical dispersion and diversification of new knowledge, its selection and integration in a given business model, emergence of innovation brokers, strict protection of intellectual rights, etc. (Chesbrough, 2006). Cross-border innovation or R&D networks are established and they consist of many units and entities which jointly innovate and create value added under a leadership of integrator, i.e. a TNC with a global brand.

Royal Philips Electronics - a Dutch manufacturer of home appliances - is one of the global leaders in business revenues, foreign assets and innovation activity.[1] In 2008 it devoted as much as 4 billion US dollars for R&D which were spent both in home and host countries. The present organization of the Philips' innovation activity has emerged after reorganization of its overall cross-border structure in the 1990s, which has resulted with more decentralization, increasing specialization, upgrading resources and competencies in the best R&D units, which act now as centers of excellence. Technological platforms have been created for speeding up internal diffusion of knowledge, technology and innovation as well as for external cooperation in joint R&D or innovation projects. Complex and integrated innovation activity makes essence of the "Open Innovation" program which was initiated in Philips a dozen years ago. Over 55% of technological projects are conducted in cooperation with other, independent entities. Thus open innovation model made a true contribution to good performance of Royal Philips Electronics in 2008, towards increasing its revenues, profits and position in the "Global 500" ranking published by "The Fortune" (2009).

Response of TNCs to the economic crisis: what future for their innovativeness?

The research of firms' innovativeness by "BusinessWeek" (2009) results in pointing out 25 corporations being the most innovative companies in the world, i.e. global innovators. The group includes the following firms (to start with No 1): Apple, Google, Toyota Motor, Microsoft, Nintendo, IBM, Hewlett-Packard, Research in Motion, Nokia, Wal-Mart Stores, Amazon.com, Procter & Gamble, Tata Group, Sony, Reliance Industries, Samsung Electronics, General Electric, Volkswagen, McDonald's, BMW, Walt Disney, Honda Motor, AT&T, Coca-Cola, Vodafone. The global innovators come from technologically advanced industries (telecommunications, information technologies) as well as from traditional industries which modernize and globalize activity (car industry, foodstuffs, trade, restaurants etc.). The above-mentioned changes in the innovation activity - with a focus on globalization, external orientation and opening to exchange of innovations - are underway in all the global innovators, although some individual "paths of innovativeness" are also recorded.

The present trends in the innovation activity of 500 firms from ten industries and dozens of countries are also published (Jana, 2009). In an annual survey made by the Boston Consulting Group, top executives of TNCs announced a slight cutting innovation expenditures or at least keeping them flat in 2009. Moreover some changes in the current innovation activity are disclosed, which include: lowering significance of innovativeness against other priorities of firms, less importance of new product innovations, strong focus on cost (and price) reducing innovations in existing products. In addition, some methods to increase savings in R&D budgets and modifications of innovation programs are introduced. Saving innovation expenditures is usually achieved due to:

- expanding research cooperation with other firms in order to cut R&D expenditures;
- better use of the research staff already employed in firms;
- increasing employment of staff in low-wage countries (e.g. India, China).

These measures are implemented alongside with many other methods of cutting costs and improving effectiveness in firms, such as restructuring, reducing staff, outsourcing and offshoring, divestment of side activities, changes in product offers and prices strategies etc.

It should be stressed that under the crisis situation all savings and modifications can be more effective in globally operating TNCs than in domestic firms. The reasons are several. Intensity of the crisis is different in particular

[1]The firm is classified in all the most important rankings which relate to global revenues (published by "The Fortune", 2009), foreign assets (World Investment Report, 2009) and innovation leaders ("BusinessWeek", 2009).

countries and continents what enables TNCs to take advantage of some foreign sales markets in countries with smaller economic slowdown. Large cross-country differences in wages and other inputs enable TNC to reduce operation costs heavily within cross-border networks and consequently to lower prices of products more than other firms do. Production can be concentrated in the most effective (in terms of costs) factories and countries what stimulates international intra-firm exchange of intermediates and final goods, unless protectionist measures are introduced in importing countries.

Beside measures improving the present effectiveness and performance, TNCs have to make efforts for enhancing their global competitiveness in the future, when economic recovery will start. Despite the present hard times, some measures are recommended for TNCs to be prepared for the future recovery:

a. Continuation of the most promising R&D programs (most probable to generate real innovations which will change competitive forces in particular sectors);
b. Engagement in mergers and acquisitions of other companies in order to restructure own organization and change competition (or competitors') structure in the sector;
c. Modification of business models to take advantage of the emerging technologies and economic trends for boosting firms' value creation and its market value in the future.

These recommendations relate to the TNCs' innovation activity as well, in particular and directly in point (a). In points (b) and (c), recommendations concern innovativeness indirectly as far as they can lay ground for crucial changes in TNCs' organization and strategy needed for creation new knowledge (and core competencies), and sustaining competitiveness. Globalization of the corporate innovation activity offers more opportunities to TNCs for access to many foreign locations or sources of knowledge as well as strategic options which can stimulate effectiveness and long-term competitiveness on the global market.

Therefore, despite slight lowering of innovation expenditures spent by TNCs in 2009 and possibly in 2010, one should not expect de-globalization of the innovation activity. It is because of opportunities for achieving advantageous results which are derived by TNCs from globalizing their innovativeness. Favourable results stemming from globalization of innovation activity boil down to improved current effectiveness through lower costs of R&D and other operations, and larger supply (offer) of cheaper and/or better products. Results for a long-run activity consist in sustaining TNCs' competitive advantages what can result from creating a new knowledge in own foreign units (centers, subsidiaries) or acquiring it from other entities abroad. New knowledge can be internalized, integrated and turned into a resource of crucial importance for future strategies of growth and competition on the global market.

If TNCs can really take advantages of effectiveness and competitiveness stemming from globalization of their innovation activity despite the present economic crisis, they will increase their rivalry and pressure to other companies (e.g. local ones) on foreign markets. However, globalization is not a universal method of sustaining TNCs' long-term success. Powerful competitors can stop a success story. Even more dangerous are unpredictable changes in the global economy and politics in the future.

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