

Aims & Scope (Economics)

Article

IMPROVEMENT OF THE INNOVATION POLICY OF WORLD CORPORATIONS AS A FACTOR FOR SUSTAINABLE DEVELOPMENT

Radyslava Shevchenko-Perepolkina,

Candidate of Economic Sciences, Associate Professor of the Department of Transport Sector Management of the Danube Institute of National University «Odesa Maritime Academy», Ukraine
<https://orcid.org/0000-0001-8665-6702>

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Abstract. The transition to a green economy is an inevitable direction of development, requiring activation of efforts for improvement of the environmental friendliness of the economies of all countries of the world economy. The article objective resides in the study of conditions and factors, identification of the models and mechanisms of the innovation activity of the transnational corporations. The methodological foundation of the research included the historical and logical method, methods of quantitative and qualitative comparisons (when determining the cross-cultural peculiarities of the innovation activity models in different countries, and methods of expert assessment and forecasting (SPACE-analysis). The authors improved the scientific and methodological approach to the justification of the mechanism of development and introduction of the innovation policies of the world automobile corporations in conditions of a low-carbon economy by adjusting the objectives of the innovation policies of automobile corporations and eliminating problems in the process of policies implementation into the company's activity. They developed innovations management strategies at the US automobile companies based on the strategic situation analysis tool – SPACE-analysis. They also recommended the use of a strategy of aggressiveness for quick reduction of costs and increase of profits in a short time.

Keywords: innovation, transnational corporations, innovation activity models, SPACE-analysis, management strategies.

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Introduction

The innovative- breakthrough character of the global economic development takes place based on the general planetary scientific and technological progress. It is provided primarily by the transnational corporations (TNC) of the world leader-countries, which thanks to the concentration of the colossal production and financial potential, efficient resources mobilization at an international scale and use of advantages of the internationalization of the markets have become the main producers of the latest products, services, and technologies.

It is TNC that form the scientific and technical component of the economic growth temps in the leading world countries, the share of which, according to the estimates of the OECD experts, increased from 38% in the middle of the XX century to 65% at the beginning of XXI century (Bhattacharya et al., 2017). That is why the acceleration of temps of innovative and technological development gained strategic significance in the global competitive struggle of all subjects of the market.

As of today, the ecologic problem moved at a global level (Carayannis et al., 2017). An increase in the popularity of the concept of low-carbon or “green economy” is largely caused by numerous crises that the world faced in recent years, in particular, climatic, ecological, food, financial, and economical crises (Coenen et al., 2015).

In general, during the last decade, the development of the world economy is influenced by techno-globalism, which is characterized by both positive and negative features (Costantini et al., 2017; Cuerva et al., 2014; Georghiou et al., 2014; Kivimaa and Kern, 2016): on one hand, one observes a dynamism of the international scientific and technological partnership at a microlevel in the aerospace and electronic industries, bio- and resources-saving technologies, mechanical engineering and instrument-making industry, pharmaceuticals, chemical and petrochemical industries, production of computer equipment; a rapid increase of the labour efficiency level, quality of products and services thanks to the introduction of the breakthrough technologies and use of the innovative forms and methods of business organization; on the other hand, the level of unemployment reaches a critical point in traditional industries, deepens dehumanization and marginalization of society, one observes increased technological load on the environment during operation of carbon sources of energy.

Under such conditions, the transnational corporations face the need and try to find new approaches to innovative activity management by development and continuous introduction of the latest models and management tools, implementation of the policy of the international consolidation of the intellectual assets (Kuhlmann and Rip, 2018; Landoni et al., 2016; Mazzucato, 2016). At the same time, one also modifies the structure of the sources of the innovative ideas: alongside its own scientific and research developments, the TNC widely use the results of the perspective R&D, carried out outside the corporation, manipulate the monopoly rights on their own and purchased intellectual property objects, receiving worldwide technological rents.

When moving to high-tech development, any industry is beginning to develop innovations at an accelerated pace (Mazzucato, 2018). If the company does not develop innovations, its competitors will do that, and the company will stay behind for one technological cycle. The culture of accelerated innovative growth has common features for all technological industries, although it can change from one company to another. The future of mechanical engineering resides in the new consumer technologies and cloud computing systems. Nonetheless, the largest automobile companies do not master breakthrough solutions quickly.

Automobile construction industry remains one of the most attractive sectors of the world economy. In conditions of high competition, innovation acts as a primary factor providing competitiveness of the automobile industry products between automakers of different countries. Given the above-mentioned details, the relevance of the selected research topic is out of the question.

The article objective resides in studying conditions and factors, identification of models and mechanisms of innovation activity of transnational corporations.

Methods

The study was carried out using the methodological principle of unity of theory and practice, dialectics of general, special and singular, as well as scientific abstraction. The methodological basis of the study included the historical and logical method, methods of quantitative and qualitative comparison (when revealing the cross-cultural features of innovation models in different countries, methods of expert assessment and forecasting) (SPACE-analysis).

While forming strategic alternatives and when choosing a specific development strategy, one uses formal models (model of accumulated experience, product life cycle model, the model of the technologies life cycle, product-market, etc.) and matrix models (model BCG, GE/McKinsey, Shell/DPM, Hofer/Schendel, ADL/LC, SWOT- and SPACE-analysis).

The article will use the SPACE-analysis, grounding on two sets of criteria, for analyzing the strategic state and assessment of further actions for TNC development:

- 1) internal criterion – efficiency of financial and economic activity;
- 2) external criterion – an external condition of the enterprise.

The mentioned criteria are characterized by a range of indicators. That is why the SPACE-analysis belongs to the category of complex multi-criteria methods. It provides the possibility to assess the position of the enterprise in the market, analyze a range of parameters of the enterprise's activity and determine the optimal strategy. It should be noted that the basis of the SPACE-analysis method involves a priority modeling, grounding on expert assessments. The feasibility of the use of

the expert assessment method in this study is justified by the following: the strategic analysis in conditions of a high level of uncertainty of the external environment often includes a number of intuitive, analytically unsupported information, aimed at solving problems; the use of the most qualified specialists in the relevant field in the analysis of assessments ensures a certain level of reliability, moreover, this reliability is highly probable, quite acceptable for making decisions in situations of incomplete certainty that constantly happen in a competitive environment; the importance of collective opinions, conclusions, recommendations, and decisions is increasing in the current conditions, although the value of individual qualified estimates in economic activity is not subject to doubts.

When using the SPACE-analysis, one distinguishes four groups of criteria for the enterprise's assessment: financial condition; competitiveness of the enterprise; attractiveness of the industry; environment stability.

When determining the system of criteria, the authors considered the specifics of the enterprise and its production capacity, financial condition, level of competition, and set tasks and objectives. The formulation of the criteria, their assessment, and the definition of the recommended strategy require a thorough knowledge of both the methodology of strategic analysis and the specifics of the industry and business of the enterprise.

Results

The objectives of innovation policies of any enterprise are shaped by many factors, in particular, internal and external factors. Among all external factors, the greatest influence on the innovation of the enterprise, in particular, in terms of promoting scientific and technological progress belongs to the state policy. So, the more the state works for the improvement of the investment and innovation climate, the easier it is for the enterprise to implement innovative policies. The most significant internal factors are the resources of the enterprise and its readiness to innovate in production. It is also worth mentioning the current business trend to reduce production costs since an extremely tough competitive environment determines the need to find methods to keep the level of profit at a sufficient level. All the above-mentioned factors determine the innovative policy of automobile producers.

The automobile manufacturing companies are trying to introduce innovations and be creative to cope with new regulations. They focus on the product design, trying to improve the current characteristics of the industry, and make it more modern and progressive thanks to innovation. They try to find solutions to solving various relevant problems, which leads to the creation, design, and manufacture of hybrid vehicles, and they also combine the use of both minerals and electric energy for making electric vehicles.

To implement these strategies, many companies have decided not to do this separately. Thus, they signed agreements about cooperation with suppliers (for production), as well as with their competitors. For the latter, the main purpose that leads to the adoption of these agreements is the high cost and risk that may arise from the implementation of innovation policies. One can consider it an example of such cooperation when one company transfers knowledge to another one as it occurs between General Motors and Toyota from NUMMI, thanks to which companies were able to generate a new innovation policy.

Cooperation between car manufacturers is becoming an increasingly frequent strategy. Such unions are considered the future for the companies around the world, regardless of their size or the sector they belong to, and they become mandatory, especially when competition grows. The advantage of such transactions in recent years is mainly explained by the increase in competition, without losing autonomy and flexibility, as well as significantly reducing investment in the necessary resources compared to other parameters. Such cooperation at a global scale enables the possibility to efficiently achieve one's own objectives of the innovation policy of a particular company.

Strategic motivation as an innovation policy objective is also important, more important than other types of motivation. Cooperation is based on a strategic component, as it affects the competitive position of partners. That is why companies that previously competed in the market are joining forces in certain projects, for example, Renault and Nissan have combined to produce

cleaner cars, with lower CO2 emission levels, and, thereby, came up to the development of electric cars. There was a similar situation with PSA Peugeot Citroen and Mitsubishi Motor Corporation – they also teamed to design and manufacture electric vehicles.

Based on the experience of modern automobile corporations, it is possible to distinguish the following important factors of the enterprise innovation policy in conditions of the low-carbon economy:

- avoid activities related to over exploitation of natural resources and breaking environmental balance; carry out the necessary research and development works on standardization in the field of ecology;
- introduce, where it is possible, the principle of “he who pollutes, should pay”;
- prevent activity, having harmful transboundary ecological influence at a state level;
- consider the environmental interests of the developing countries, taking into account, in particular, the environmental factors in the international trade and cooperation; take measures for the explanation of the environmental policies, attract and assist relevant international organizations with such activity;
- involve the public widely to activity, aimed at protection and saving of environment;
- properly distribute powers (local, regional, federal, national and international) and responsibilities in the fight against certain categories of pollution with consideration of the specifics of the territories that should be protected.

When forming the innovation policy, there is certainly a risk that low-carbon economic conditions will affect growth prospects in individual countries. The implementation process may result in trade restrictions due to unilaterally imposed regulations or adjustments at international prices. Developing countries may suffer more, as they may not have the capacity to enforce the world-wide brutal standards, which in turn may lead to the loss of markets. A decrease in national export capacity could lead to slower growth, lower employment and a deterioration in the foreign trade balance.

Table 1. Factors of innovation activity of the corporations

Group of factors	Restraining factors	Stimulating factors
Techno-economic	Absence of sources of funding, a weak material, technical, and scientific base; domination of the interests of existing production; high economic risk; a lack of demand for products, absence of information about markets, complications and high cost of research and development; the low scientific and innovative potential of the enterprises	Availability if a reserve of financial and material and technical measures, availability of the required economic and scientific and technical infrastructure, development of competition and reduction of a lifecycle duration of resources consuming products, preservation of scientific and technical potential and state support for innovation activity
Organizational-managerial	Sustainable organizational structures, excessive centralization, the conservatism of hierarchical principles of organizational structure, the predominance of vertical information flows; institutional closure, difficulties in intersectoral interactions; focus on established markets; focus on short-term payback; lack of scientific and innovative organizational structures, lack of international cooperation	The flexibility of organizational structures, democratic style of management, the domination of horizontal information flows, indicativeness of planning, possibility to make adjustments, decentralization, autonomy, formation of target problem groups, international scientific and technical cooperation, creation of an innovation infrastructure
Legal	The imperfection of the legal framework on innovation, protection of intellectual property	Legislative measures (benefits, laws) that encourage innovation
Socio-psychological	Resistance to changes that can cause such consequences as the change of status, need for new activities, change of stereotypes of behaviour, existing traditions, fear of uncertainty, fear of responsibility for a mistake, against everything new, an outflow of scientific personnel	Susceptibility to changes, innovation, moral reward, development of conditions of creative work, material incentives.

We think that the innovation policy should be adjusted with consideration of factors that have a direct impact on determining objectives and the definition of the overall strategy of the

enterprise in the direction of innovative development. Table 1 shows a systematized list of factors of the innovation activity, which are grouped as follows: techno-economic, organizational-managerial, legal, and socio-psychological.

Summing up, one should note that significant competition in the global market of automobile makers encourages companies to increasingly use innovative technologies and look for new ways of achieving the highest level of efficiency and profitability. As of today, resources and energy-saving technologies are the most popular areas of innovative development. This is primarily due to the global community's activation in the direction of reducing global pollution, and many countries developed strategies for transition to carbon-free economies.

Given the trends of recent years, the automobile makers should not only introduce innovations, but also effectively manage them with consideration of the environmental norms, requirements, and prospects for the development of low-carbon economies. That is why we think that automobile companies should create and implement environmental management systems as quickly as possible. The companies that already have an appropriate division in structure can apply an environmental-economic rating.

To implement long-term innovative programs, we consider it is necessary to use the following algorithm of their organization:

- 1) Development of the methodology and documents (regulation base) on the organization of systematic work on the identification of requests for innovation and organization of innovation activity.
- 2) Formation of a database for technical, production, and technological problems.
- 3) Formation of channels for attracting potential participants of a problem-solving process.
- 4) Competitions of the innovative projects.
- 5) Schools, programs, and courses of innovative management.
- 6) Organization of consultancy centres, IT-resources, and information bases.
- 7) Staff selection and formation of project groups for the implementation of the innovation projects in the interests of the enterprise.
- 8) Formation of the innovation culture at the enterprises of the corporation.

Apart from the assessment of the quantitative indicators of innovations introduction, it is advisable to determine the market position and justify the optimal strategy using SPACE-analysis for the automotive enterprises. The results of the scoring of the key criteria indicators are given in Table 2.

Table 2. Results of the scoring of the key criteria upon the method of SPACE-analysis for the US automobile companies

Criteria	Score, points	Weight	General points assessment (points*weight)
The financial strength of the enterprise (FS)			
Return on equity	6	0.4	2.4
Stability of profit	5	0.3	1.5
Level of financial firmness	4	0.3	1.2
The general assessment of the criterion	X	X	5.2
Competitive ability of the enterprise (CA)			
Share of the enterprise in the market	6	0.3	1.8
Temps of market share growth	4	0.2	0.8
Profitability of product sales	5	0.5	2.5
The general assessment of the criterion	X	X	5,1
The attractiveness of the industry (IS)			
The profitability level of the industry	7	0.5	3.5
Lifecycle stage of the industry	5	0.3	1.5
Industry's growth dependence on the conjuncture	5	0.2	1
The general assessment of the criterion	X	X	6
Stability of the industry (ES)			
Stability of profit	6	0.4	2.4
Level of innovation activity development in the industry	2	0.2	0.4
Marketing and advertising capabilities	5	0.4	2
The general assessment of the criterion	X	X	4.8

After getting general assessments of the key criteria, let us build a vector recommended to the strategy of the enterprise’s development in SPACE coordinate system (Figure 1).

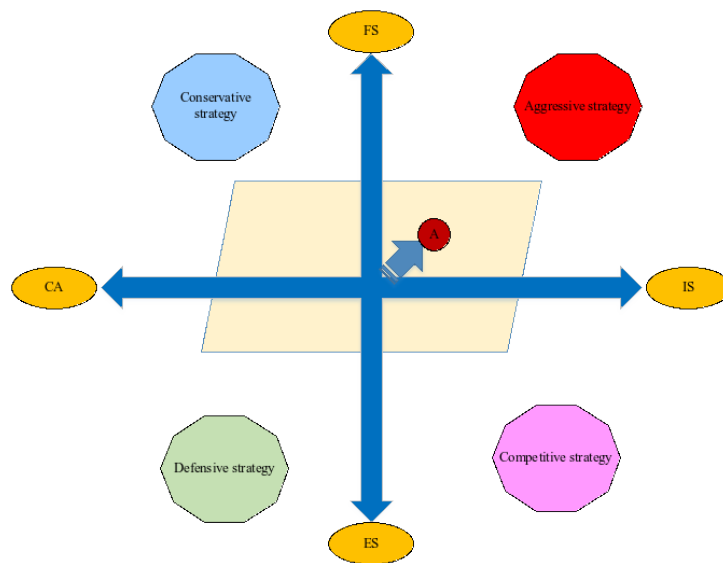


Figure 1. The SPACE matrix for automobile companies

Thus, according to the held analysis, an aggressive strategy is the optimal solution for companies (the point with coordinates A 0.9:0.4).

Active offensive strategy (strategy of leadership) stands for the setting the goal of becoming the first, leading enterprise in a certain area of activity and sales. Typically, even big and powerful enterprises do not risk using it for a wide range of products. As a rule, it is applied to one or several individual products, in the environment providing favorable conditions for holding such an innovative policy (resources, scientific and technological capacity). An active offensive strategy is extremely risky from the point of view of gaining and maintaining market positions. It is usually associated with significant spending of resources.

Discussion

Technological and market leadership grounds on the development of basic and radical innovations (Mihaela and Titan, 2014). The implementation of the strategy of leadership requires a thorough scientific and research support: a wide range of research works in related fields and constant connection with fundamental research; constant review of the most important results of R&D for their introduction in production; immediate changes in funding priorities depending on the expected marketing results. When it comes to the field of research and development, one should form a strong base, the availability of qualified personnel is especially important, as well as the establishment of permanent links between all parts within the innovation process.

When forming their innovation policy, the developed automobile companies should consider the dangers, which appear in relation to non-carbon economies. There is undoubtedly a danger that “green protectionism” will affect the growth prospects in particular countries (Quitow, 2015). The greening of the global economy could result in imposing trade restrictions due to the imposing regulations or adjustments in international prices on a unilateral basis. There is also a risk from the application of environmental standards, which are generally important for the transition to “a green economy” but could lead to a new form of protectionism.

We think that innovation policies should be adjusted with consideration of all factors of innovation activity, which directly influence the process of objectives determination and the definition of the overall strategy of the enterprise in the direction of innovative development. Significant competition in the global market of automobile makers encourages companies to increasingly apply innovative technologies and look for new ways of achieving the highest level of efficiency and profitability (Schot and Steinmueller, 218; Tonurist, 2015). As of today, resources and energy-saving technologies are the most popular areas of innovative development. This is primarily due to the global community’s activation in the direction of reducing global pollution, and many countries developed strategies for transition to carbon-free economies (Vob & Simons, 2014).

For better implementation of the innovative policies of automobile corporations, it is necessary: to strengthen the role of management in the company's administrative and economic management system; consider the consequences that may appear in the course of making management decisions; develop one's own system for assessment of the innovation activity and innovation potential of the company; strengthen control and provide the adherence to the laws of the home base country; stimulate modernization and technical re-equipment following the modern requirements and trends observed from the main competitor companies.

Conclusion

To conclude, one should mention that more effective implementation of the innovation policies of automobile corporations requires taking the following measures: strengthening of the role of management in the company's administrative and economic management system; consider the consequences that might appear during making decisions; develop one's own system for assessing the innovative activity and innovation potential of the company; strengthen control and provide compliance with the laws of the home base country; stimulate modernization and technical re-equipment following the modern requirements and trends observed from the main competitor companies.

The research suggests the use of the technological audit and holding a comprehensive analysis of the scientific and technical block of the company. The authors also offered to develop and introduce the corporate knowledge management systems at the enterprises, which will enable the possibility to introduce innovations more efficiently.

According to the analysis, held by SPACE, an aggressive strategy is an optimal choice for the USA companies, which means the setting of the goal of becoming the first, leading enterprise in a certain area of activity and sales. Typically, this strategy is used to one or several individual products, in the environment providing favourable conditions for holding such an innovative policy (resources, scientific and technological capacity). An active offensive strategy is extremely risky from the point of view of gaining and maintaining market positions. It is usually associated with significant spending of resources.

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References

- Bhattacharya, U.; Hsu, P. H.; Tian, X.; Xu, Y. (2017). What affects innovation more: policy or policy uncertainty? *Journal of Financial and Quantitative Analysis*, 52(5), 1869-1901. <https://doi.org/10.1017/S0022109017000540>
- Carayannis, E. G.; Meissner, D. (2017). Glocal targeted open innovation: Challenges, opportunities and implications for theory, policy and practice. *The Journal of Technology Transfer*, 42(2), 236-252. <https://doi.org/10.1007/s10961-016-9497-0>
- Coenen, L.; Moodysson, J.; Martin, H. (2015). Path renewal in old industrial regions: Possibilities and limitations for regional innovation policy. *Regional studies*, 49(5), 850-865. <https://doi.org/10.1080/00343404.2014.979321>
- Costantini, V.; Crespi, F.; Palma, A. (2017). Characterizing the policy mix and its impact on eco-innovation: A patent analysis of energy-efficient technologies. *Research policy*, 46(4), 799-819. <https://doi.org/10.1016/j.respol.2017.02.004>
- Cuerva, M. C.; Triguero-Cano, A.; Corcoles, D. (2014). Drivers of green and non-green innovation: empirical evidence in Low-Tech SMEs. *Journal of Cleaner Production*, 68, 104-113. <https://doi.org/10.1016/j.jclepro.2013.10.049>
- Georghiou, L.; Edler, J.; Uyarra, E.; Yeow, J. (2014). Policy instruments for public procurement of innovation: Choice, design and assessment. *Technological Forecasting and Social Change*, 86, 1-12. <https://doi.org/10.1016/j.techfore.2013.09.018>
- Kivimaa, P.; Kern, F. (2016). Creative destruction or mere niche support? Innovation policy mixes for sustainability transitions. *Research Policy*, 45(1), 205-217. <https://doi.org/10.1016/j.respol.2015.09.008>
- Kuhlmann, S.; Rip, A. (2018). Next-generation innovation policy and grand challenges. *Science and public policy*, 45(4), 448-454. <https://doi.org/10.1093/scipol/scy011>
- Landoni, P.; Dell'Era, C.; Ferraloro, G.; Peradotto, M.; Karlsson, H.; Verganti, R. (2016). Design contribution to the competitive performance of SMEs: The role of design innovation capabilities. *Creativity and Innovation Management*, 25(4), 484-499. <https://doi.org/10.1111/caim.12165>
- Mazzucato, M. (2016). From market fixing to market-creating: a new framework for innovation policy. *Industry and Innovation*, 23(2), 140-156. <https://doi.org/10.1080/13662716.2016.1146124>
- Mazzucato, M. (2018). Mission-oriented innovation policies: challenges and opportunities. *Industrial and Corporate Change*, 27(5), 803-815. <https://doi.org/10.1093/icc/dty034>

- Mihaela, M.; Titan, E. (2014). Education and innovation in the context of economies globalization. *Procedia Economics and Finance*, 15, 1042-1046. [https://doi.org/10.1016/S2212-5671\(14\)00667-4](https://doi.org/10.1016/S2212-5671(14)00667-4)
- Quitow, R. (2015). Dynamics of a policy-driven market: The co-evolution of technological innovation systems for solar photovoltaics in China and Germany. *Environmental Innovation and Societal Transitions*, 17, 126-148. <https://doi.org/10.1016/j.eist.2014.12.002>
- Schot, J.; Steinmueller, W.E. (2018). Three frames for innovation policy: R&D, systems of innovation and transformative change. *Research Policy*, 47(9), 1554-1567. <https://doi.org/10.1016/j.respol.2018.08.011>
- Tonurist, P. (2015). Framework for analysing the role of state owned enterprises in innovation policy management: The case of energy technologies and Eesti Energia. *Technovation*, 38, 1-14. <https://doi.org/10.1016/j.technovation.2014.08.001>
- Vob, J.P.; Simons, A. (2014). Instrument constituencies and the supply side of policy innovation: The social life of emissions trading. *Environmental Politics*, 23(5), 735-754. <https://doi.org/10.1080/09644016.2014.923625>



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