

Statistical Reporting as the Basis for Statistical Monitoring of Innovation

The aim of the article is to use the system approach to analysis of the official statistical observation of company innovation in Ukraine. Legal framework for the statistical survey of innovation in Ukraine is highlighted. The role of statistical reporting in the statistical survey of innovation is discussed. An extended review of definitions of “innovation”, “innovation activities”, “innovative products” and “innovating entities” in various regulatory acts of Ukraine is made. The content of reporting forms for the official statistical survey of company innovation in Ukraine, used in 2003–2016, is shown. The indicators contained in various forms of statistical reports on innovation are given, conclusions are made.

Keywords: survey, statistical reporting, innovation activities, product innovation, process innovation, innovation market, spending on innovation.

Problem setting. Statistical surveys on company innovation constitute an important source of innovation statistics at company level, required for making decisions specific to innovation. These statistical surveys can be effective if their objectives are compliant with the statistical survey methodology. It raises the importance of the studies related with methodological evolution of statistical forms for the innovation activity survey.

Review of previous works and publications. Regulation of the innovation system in Ukraine, the innovation market and innovation performance in Ukraine is analyzed in [1]; the international experience of statistical studies of the innovation market, product innovation in the system of statistical classifications, indicators of research and innovation developed in EU countries, international comparisons of the innovation performance, methods for studies of the innovation market are studied in [2; 3]; the role of company report as the basis for decision making in innovation management is analyzed in [4].

The aim of the article is to use the system approach to analysis of the official statistical survey of innovation.

Results. The innovation development of in Ukraine is studied by indicators such as number of innovating companies, share of active participants in the innovation market, number of developed products, number finished innovation products, including by innovation field. The author believes in the need to use the system approach to consider a number of factors [1, p. 355]. One of the tasks of the innovation statistics is to introduce the system approach to statistical work [7]. Studies of time series for selected periods, by sector or economic activities, allow for effective regulatory action. Statistical observations are required to build the database for innovation management, which is based on statistical reports from innovating entities (respondents).

In the modern conditions of development of economics, integration of theoretical and practical aspects of business using scientific principles of statistics for decision making is required.

Statistical reporting is a system of aggregated indicators in form of reports made up by a specially approved form, describing business results and conditions of a company for a certain period of time. The objective of company reporting is to provide the general needs of the general public who rely on it as a primary source of economic information on the companies' decision-making. Reporting consists of elements that are in interaction and subordination of achieving the same goal. Given the objectives of the study, it should be noted that an important element of reporting is its form with a set of specific indicators. Statistical reporting refers to documents of a special format, designed to collect statistical data; a form of statistical data collection in which every stakeholder regularly provides information to the official statistics

bodies in form of documents (reports) of the specifically approved form. Reports are compiled by data of operating records and accounting records.

Subject of compilation of statistical reporting by companies for their innovation has statutory definition contained in the Law of Ukraine [5] and in the Economic Code of Ukraine [6]. This wording lays the basis for the requirements for companies to show innovations and innovation activity in the statistical reporting. Organization and methodology of official statistical observations of innovation is described in methodological guidelines on innovation statistics [7]. The toolkit for statistical survey includes definitions harmonized with international recommendations.

Innovation activities of companies refer to all the scientific, technological, organizational, financial and commercial actions aimed at implementing innovations or conceived for this purpose. The standards for compilation of innovation statistics require from companies to disclose the processes specific to innovation, taking place at company level, in the workplaces, and in the company's external relations. I. e. the facts of innovation within an innovating entity or at the innovation market are taken as the basis (Table 1).

Table 1

The concepts of “innovation”, “innovation activities”, “innovative products” and “innovating entities” in various regulatory acts

	Definition	Legal act
<i>Innovation</i>		
1	Introduction of a significantly improved product (a good or a service) or a process, a new marketing method or a new organizational method in a company, a company's workplace or company's external relations.	Order of the State Statistics Committee of Ukraine, the 10.01.2013 No 3 [7]
2	Newly created (used) and (or) improved competitive technologies, products or services, and organizational or technical decisions of industrial, administrative, commercial or other character, which significantly improve the structure and quality of production and (or) social sphere.	The Law of Ukraine “On Innovation Activities” [5]
<i>Innovation activities</i>		
3	Innovation activities refer to all scientific, technological, organizational, financial and commercial actions that lead to implementation of innovations or conceived for this purpose. Also, innovation includes research and development that is not related to a specific innovation	Order of the State Statistics Committee of Ukraine, the 10.01.2013 No 3 [7]
4	Activities aimed at using and commercializing the results of research and development, and at promoting new competitive products and services to the market.	The Law of Ukraine “On innovation activities” [5]
5	Innovation activities in the economy refer to activities of economic entities, based on investing in long-term science and technology programs with long payback periods and introduction of new science and technology achievements in production and other spheres of public life.	Economic Code of Ukraine [6]
<i>Innovative products</i>		
6	Products (goods, works or services) introduced to the market, which are new or significantly improved in terms of properties or methods of use. Products (new or improved) may be new to company, not only to economic sector or market in general. Innovative products include the above mentioned products launched in production and introduced to domestic market in a reporting period.	Order of the State Statistics Committee of Ukraine, the 10.01.2013 No 3 [7]
<i>Innovating entity</i>		
7	Innovating company (organization) is a legal entity that was implementing any kind of innovation in a given period.	Order of the State Statistics Committee of Ukraine, the 10.01.2013 No 3 [7]
8	Company active in innovation is a company that in the period of survey was engaged in activities related to innovating, regardless of whether or not such activities led to really introduced innovations.	Order of the State Statistics Committee of Ukraine, the 10.01.2013 No 3 [7]

By these requirements, innovations are divided into two types: technological and non-technological innovations. Technological innovations include product and process innovations. Non-technological innovations include marketing and organizational innovations.

Critical analysis of the content and form of statistical reporting on innovation at Ukrainian companies covers six forms of company reports entered into force by the respective resolutions of the State Statistics of Ukraine: forms for the survey of technological innovation at industrial companies, used by official statistics offices at the beginning of 21 century. Results of the analysis are presented in Table 2.

Table 2

The Content of Reporting Forms of Ukrainian Companies on Innovation for 2003–2016

	Questions	Reporting forms of companies with innovation activity, number of the order approving a form, year, answers: “+” yes, “-” no					
		No 1-innovation order No 290, 2003	No 2-industrial (innovation) order No 558, 2004	No INN, order No 493, 2010	No 1 innovation order No 471, 2012	No 1-innovation order No 319, 2015	No INN, order No 225, 2016
1	2	3	4	5	6	7	8
1	Innovation activity of the company (innovation)	-	+	-	+	-	+
2	Spending on innovation	-	-	-	+	+	+
						spending in the reporting year	types of spending expected spending for 2017–2018
3	Product innovation (goods and services)	+	-	+	-	+	+
		sources of funding for technological innovation				number of introduced product innovations sales of product innovations	number of introduced product innovations
4	Process innovation	+	-	+	-	+	+
						process innovations number of introduced new technological processes number acquired new technologies	number of introduced new technological processes

Table 2 continued

1	2	3	4	5	6	7	8
5	Prolonged or terminated process or product innovation	+	+	+	+	+	+
		sales of innovative products	sales of innovative products		sales of innovative products	number of introduced product innovations, sales of product innovations	innovation continuing or has been discontinued
6	Innovation activities and spending on process and product innovations	+	-	+	+	+	-
		spending on technological innovation			spending on innovation		
7	Introduction of new advanced technological processes, development of innovative products, acquisition of new technologies	-	+	-	-	-	+
8	Organizational innovation	-	-	+	+	-	+
9	Marketing innovation	-	-	+	+	-	+
10	Innovation in logistics	-	-	-	-	-	+
11	Intellectual property Rights	-	-	-	-	-	+
12	Financial support to innovation	-	-	-	-	-	+
							financial support and sources of support
13	Creativity and skills	-	-	+	-	-	-
14	General information	+	-	+	-	-	+
15	General economic information	-	-	+	-	-	-
16	Additional information about your company	-	-	-	-	-	+
							the level of higher education of the staff

Table 2 continued

1	2	3	4	5	6	7	8
17	Sources of information and cooperation in the context of innovation	–	–	+	–	–	+
							the degree of importance, partners
18	Innovation objectives during in 2008–2010	+	–	+	–	–	–
		results of innovating					
19	Factors that inhibit innovation	+	–	+	–	–	+
20	The impact of legislation or regulations on innovation	–	–	–	–	–	+
21	Non-innovating company	–	–	–	–	–	+
22	Type of reporting forms	annual, post	quarterly, urgent	one-time	annual	annual	once in two years

A company discloses in reporting forms a wide range of data about its innovation. The region where innovations have been introduced is indicated: Ukraine, EU and other countries. The main innovation objectives, according to respondents, are the following: expand the range of goods or services; replace old products or processes; access to new markets or increase the market share; improve the quality of products/services; reduce the time for marketing of innovations; increase the production flexibility; increase the production capacity; reduce labour costs per unit; reduce materials and energy costs per unit; reduce the environmental impact, improve health and safety, etc. Innovation at company level covers research and development (R&D) projects (internal and external), purchase of machinery, equipment or software, acquisition of new external knowledge, training and retraining of staff. Implementation of innovative products expected for the market for the company. Company's innovations are meant for the market or for a company. Sales (purchase) of technologies and competencies take the following forms: rights for patents, licenses, R&D, know-how, agreements on technology purchase (sale), recruitment of competent staff etc. The reports contain data on costs: internal, external; sources of funds: own budget, investors and loans.

Indicators used in the survey. For the analysis of innovation activities at industrial companies by the form of official statistical observation No INN-innovation (every two years), seven key indicators are developed [7]: (i) number of innovating companies; (ii) innovation activity of industrial companies: share of innovating industrial companies in the total industrial companies; (iii) total spending on innovation (thousand UAH): the company's spending on innovations that are new for company and new for market, including internal R&D, purchase of R&D, machinery, equipment and software, other external competencies; the indicator includes current and capital spending; (iv) number of industrial companies introducing innovations (new or improved products) (except for simple resale of new goods purchased in other companies, and purely aesthetic change in products); (v) number of introduced product innovations in a reporting year, with separately shown innovations that are new for company; (vi) number of companies with sales of product innovations in a reporting year; (vii) sales of product innovations (thousand UAH): sales of product innovations that were introduced, were subject to essential technological modifications or improvements in the latest three years (product innovations new for market and new for company); (viii) number of industrial

companies introducing process innovations in a reporting year; (ix) number of introduced process innovations (new or improved methods for processing or manufacturing of products); (x) number of purchased (transferred) new technologies (technological achievements); (xi) number of enterprises that purchased or transferred new technologies (technological achievements) in a reporting year.

For the analysis of the innovation activity by the form of official statistical observation No INN (every two years) seven key indicators are developed [7]: (i) number of innovating companies: number of companies engaged in innovative activities during the survey; (ii) number of companies with technological innovation: number of companies engaged in technological innovation during the survey; (iii) average employment at innovating companies during the survey; (iv) spending on innovation (thousand UAH), including wages of employees; (v) total sales (products and services) of innovating companies (thousand UAH): sales of products in the period specified in the survey are measured by the selling price of shipped finished products (works, services), fixed in the invoice, irrespective of payment receipts, without value added tax, excise duty and other indirect taxes; (vi) sales of innovative products (services): the share of sales of innovative products (services) in the total sales of a company; (vii) total spending on innovation (thousand UAH): includes funds from various sources to cover innovation spending of a company.

Conclusions. Entities of the innovation market in Ukraine are government, business enterprise entities (companies and individuals) and institutions (universities, academies, research institutes, etc.). In Ukraine harmonization of the national statistics with international statistical standards is going on. Analysis of the contents of the main forms of statistical reporting on the innovation activity shows that the collected data cover innovation spending, sales of innovative products and revenues from innovating. Indicators of statistical reporting forms provide an opportunity to clarify the objectives of innovation and the factors that hinder the innovative activity in Ukraine. The system approach to the official statistical observation of the innovation activity of companies involves setting up of observation goals, forms and types, organization of observations, sampling of reporting units, elaboration of the methodology for summing up the results, assessment of various indicators on the basis of reporting forms etc.

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В. П. ПАНТЕЛЕЄВ

доктор економічних наук, професор,
декан економіко-статистичного факультету,
Національна академія статистики, обліку і аудиту

Статистична звітність як основа статистичного спостереження інновацій

Метою статті є використання системного підходу до аналізу державних статистичних спостережень інноваційної діяльності на підприємствах України. Показано законодавчу базу статистичних обстежень інноваційної діяльності в Україні. Висвітлено роль статистичної звітності в статистичних обстеженнях інноваційної діяльності. Наведено докладний огляд визначень понять “інновації”, “інноваційна діяльність”, “інноваційна продукція” та “суб’єкти інноваційної діяльності” у різних правових актах України. Розкрито зміст форм звітності державного статистичного обстеження інноваційної діяльності підприємств в Україні, які використовувались протягом 2003–2016 років. Вказано основні розрахункові показники, які містяться у різних формах статистичної звітності щодо інновацій, зроблено висновки.

Ключові слова: обстеження, статистична звітність, інноваційна діяльність, інновація продукції, інновація процесу, ринок інновацій, витрати на інновації.

В. П. ПАНТЕЛЕЕВ,

доктор экономических наук, профессор,
декан экономико-статистического факультета,
Национальная академия статистики, учета и аудита

Статистическая отчетность как основа статистического наблюдения инноваций

Целью статьи является использование системного подхода к анализу государственных статистических наблюдений инновационной деятельности на предприятиях Украины. Показана законодательная база статистических обследований инновационной деятельности в Украине. Освещена роль статистической отчетности в статистических обследованиях инновационной деятельности. Приведен подробный обзор определений понятий «инновации», «инновационная деятельность», «инновационная продукция» и «субъекты инновационной деятельности» в разных правовых актах Украины. Раскрыто содержание форм отчетности государственного статистического обследования инновационной деятельности предприятий в Украине, которые использовались в течение 2003–2016 годов. Указаны основные расчетные показатели, содержащиеся в различных формах статистической отчетности по инновациям, сделаны выводы.

Ключевые слова: обследование, статическая отчетность, инновационная деятельность, инновация продукции, инновация процесса, рынок инноваций, затраты на инновации.

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