

STATISTICAL PRESENTATION OF INNOVATION ACTIVITIES IN ENTERPRISES – OSLO MANUAL 2005 PROPOSALS AND THE CENTRAL STATISTICAL OFFICE PRACTICE

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Abstract

The rules for collecting and interpreting data covering innovative activities carried out by enterprises are specified in the Oslo Manual 2005 (OM 2005), however, its recommendations should also be subject to the discussion aimed at the improvement of public statistics presentation. The problems discussed in the presented article remain a part of such debate and concentrate on the critical analysis of OM 2005 proposals and the comparative analysis of both suggested (OM 2005) and applied procedures (Central Statistical Office, PNT-02, PNT-02/u reports) in terms of collecting information about innovative processes implemented by companies. The concluding remarks were considered the sufficient reason for introducing significant modifications in the reports about innovative activities, used within the framework of Community Innovation Survey (CIS). The authors of the article suggested:

- the registration of expenditure on innovation in terms of value for all innovation types maintaining the current level of data aggregation,
- the decomposition of total expenditure on innovation into the positions grouping expenditure on implemented, potential and abandoned innovations,
- the introduction of additional measurement for innovation results in an aggregated form for all its types.

The suggested improvements are of supplementary nature i.e. specify the so far collected data.

Key words: innovation processes, reports on innovation activities, Oslo Manual

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Introduction

Collecting data both reliable and comparable in time and space, covering innovation activities carried out by enterprises is connected with adopting the conventional definition of these

processes, capturing their diversified type and nature and primarily recognizing uniform research procedures, as well as the choice of data collecting method about the expenditure on new or significantly improved solutions and their results (objective or subjective approach; quantitative or qualitative cross-section). The solutions in this respect are not obvious and should become an incentive for discussions. The presented article constitutes a voice in such a debate. Its purpose is to evaluate the Oslo Manual 2005 guidelines in terms of collecting information about innovation processes carried out by companies and the extent to which they are reflected in procedures of the Central Statistical Office (CSO), along with identifying the resulting recommendations.

1. Innovation activities – the concept and the suggested rules for data collecting (Oslo Manual)

Innovation activities (IA) – in the Oslo Manual terminology – cover “*all scientific, technical, organizational, financial and commercial steps which actually lead, or are intended to lead to implementing innovations*”. (OECD/European Communities, 2005). This definition states clearly that the implementation of new or significantly improved solutions is not the only criterion of IA identification, but also the activities focused on this objective, which are not necessarily successful. Such approach results in distinguishing innovation processes of threefold nature, i.e. the activities (Stawasz & Niedbalska, 2011):

- successfully completed, i.e. finalized with implementing an innovation regardless of its commercial effect,
- continued, which can result in implementing new or significantly improved solutions in the future,
- interrupted or abandoned prior to the implementation of innovation.

The above quoted definition of innovation activities is supplemented by the guidelines referring to the method for conducting research covering these processes. In their course, in accordance with the Oslo Manual guidelines, both subjective and objective approach can be applied. The first of them comes down to the presentation of total expenditure on innovation processes incurred by a company in a calendar year or in a different period of time, whereas the latter provides for recording the total expenditure on particular innovations, implemented in a given year or period regardless of the year in which the expenditure was incurred. Moreover, it is noticeable that the subjective approach takes into account the expenditure on activities related to the implemented innovations (successfully

completed), potential ones (continued as a process) and discontinued (permanently abandoned or interrupted in time) (Teece, 2010; OECD/European Communities, 2005), whereas in case of objective approach all expenditure on implemented innovations or their group (primary innovations) are taken into account in a particular period of time, excluding expenditure on the abandoned or discontinued innovation, and also the general research and development activities, i.e. unrelated to any particular application. The advantages and disadvantages of these approaches recommend, in the opinion of Oslo Manual authors, to follow the subjective presentation of the statistics describing innovation activities (OECD/European Communities, 2005).

The recommended picture of innovation statistics as a process focuses on the general outlays on innovation, covering expenditure on the successful, continued and abandoned processes, which allows capturing their scale, however, not their results. Such approach seems to be justified by the need for collecting data from a defined space (e.g. the member states, a country or a region) about all enterprises in a specific time (e.g. calendar year). In terms of an individual entity it is possible to carry out a simple calculation of innovation activities, considering the expenditure incurred on these processes and the achieved effects in the form of selling new or significantly improved solutions. In this case the timeframe of conducted research would cover the period of successful innovation activities, i.e. finalized with implementing a new or significantly improved solution and the length of its lifecycle (De Propriis, 2002). Highly individualized nature of such data covering all enterprises results in the absence of possibilities for their grouping in either regional or national scale or any other space in the closed time interval. It is incomprehensible, however, why the subjective presentation of the scale of innovation activities should include the expenditure on processes related to implemented, potential and abandoned innovation without breaking them down into the above listed groups? This classification would allow making the general value judgements about the quality of innovation processes. Furthermore, it should be considered if taking an objective perspective, referring to specific, implemented innovation is not a better approach. If so, the data collected about the expenditure on innovation activities would be recorded at the time of an innovation implementation and the timespan of expenditure incurred on these processes would not matter at all. Therefore, the data collected in a particular year would group expenditure from many years, but would refer to the successfully completed processes only. Ineffective innovation activities (interrupted, abandoned) would disappear from the field of view, whereas in the subsequent reporting periods the potential innovation processes (continued in a particular reporting year) would be either positively or negatively verified.

Changing the data collecting rule from subjective to objective perspective will not solve the problem of assessing the results of innovation activities. The Oslo Manual recommends measuring them by (OECD/European Communities, 2005; Shypulina, 2015; Echeverria, 2008):

- the estimated sales share of either new or significantly improved products in an enterprise total sales and separating the new ones for the market or the company,
- the estimated percentage of sales resulting from commercial innovation in the total sales of an enterprise, including the share of sales related to products and services presenting improvements in terms of construction/project and/or packaging and new commercial methods in the sphere of prices, promotion or distribution,
- the estimated, percentage change in the level of innovation specific costs resulting from processes (e.g. increase or decrease up to 5 %, ranging from 5 % to 25 %, over 25 %),
- the estimated, percentage change in the level of employment resulting from innovation within the framework of processes,
- the estimated, percentage change in the level of average costs resulting from organizational innovation.

Such presentation of innovation activities' results does not offer possibilities for comparing the expenditure and effects of these processes, but it seems justified by the group of entities from which the data are collected (e.g. enterprises from a selected country, region) in a specific period (e.g. calendar year). It seems less founded to suggest providing estimated values by enterprises in a percentage presentation, e.g. approximate sales share resulting from new or significantly improved products in the total sales of an enterprise. The Oslo Manual rightly observes that in case of any questions *"concerning the impact of innovation on the level of sales the enterprises will, at best, be usually able to provide rough estimates only"* (OECD/European Communities, 2005), but these relationships do not need to be presented as percentage ones. Moreover, their identification has to be preceded by estimating the value of sales due to innovation (e.g. product, process ones), otherwise they will just represent rough estimates. In such perspective the questions about e.g. sales value resulting from the implementation of particular innovation and the total sales value guarantee an increased reliability of the information obtained. Additionally, this solution allows capturing the scale of the discussed phenomenon, which cannot be inferred from the relationship of selling new or significantly improved products and the total sales of a given enterprise or a group of enterprises.

The Oslo Manual is familiar with the proposal for collecting value specific data. It divides the data referring to innovation activities into quality and quantity ones, which allow determining whether enterprises were conducting the particular type of innovation activities and the level of expenditure they incurred on this category of innovation processes. However, a type is not synonymous to the nature of innovation activities. The specificity of such processes, as it has already been mentioned, results in distinguishing successfully completed activities, continued or abandoned, whereas the type indicates: research and development activities, steps taken for the needs of product and process oriented innovation and initiated for the benefit of commercial or organizational innovation (Angilella & Mazzu, 2015; OECD/European Communities, 2005). Obtaining data about the expenditure in these cross-sections, directly from the accounting system of an enterprise is not always possible and the questions about the sales value of innovative solutions (e.g. products, services) seem equally important.

2. Innovation activities in the Central Statistical Office reports about innovation against the Oslo Manual guidelines

The Oslo Manual guidelines referring to data collection about innovation activities carried out by enterprises are not fully reflected in the picture of Polish public statistics. The reports on innovation in industry (PNT-02) and services (PNT-02/u) for the period 2013-2015 do not identify all expenditure on innovation processes. The research concentrates on expenditure incurred on new or significantly improved products and processes. Therefore, the expenditure related to activities focused on commercial or organizational innovation disappears from the sight of public statistics. In such case it is only identified whether enterprises introduced: new methods in terms of operating rules, division of tasks and decision-making entitlements among workers, relations with the environment (organizational innovation), as well as the significant changes in a project/construction or packaging of products or services, new media or techniques for products' promotion, new methods related to products' distribution or influencing prices of goods and services (commercial innovation). The dichotomous measurement scale of these phenomena (answers: yes or no) rules out the possibility for defining their size. A similar situation takes place in case of categorizing product and process oriented innovation. Moreover, in their system it is only identified whether enterprises introduced new or significantly improved solutions regarding: products or services in either

the market or the analysed entity scale and also production methods, logistics, supply and distribution or support for processes in enterprises (CSO 2016a, CSO 216b).

The value specific presentation of expenditure on innovation processes refers – as mentioned above – to product and process innovation only. These outlays represent the sum of expenditure incurred on the particular types of innovation activities (e.g. purchasing external knowledge, personnel trainings directly related to introducing product and process innovation and their categories are – in general terms – in line with the Oslo Manual guidelines. Such presentation, however, does not recognize the nature of innovation processes, which does not allow for specifying the expenditure on successful, continued or abandoned innovation activities.

Wider discrepancies in the Oslo Manual guidelines and the content of reports on innovation carried out by enterprises are observed in the results of innovation activities. They, as it was agreed, cannot be identified based on comparing expenditure and effects achieved by all enterprises, however, they can be recorded thorough the impact of innovation on sales, costs, employment, etc. The suggestion for collecting the data which allow specifying the share of net income on sales of new or significantly improved products in total net income of an enterprise was the only one used out of the entire spectrum of the available proposals in this matter.

3. The proposal for presenting innovation activities in the reports on innovation

The statistical picture of innovation activities is not planned to be subject to any radical changes (e.g. objective presentation instead of a subjective one), however, it can be significantly modified. Such improvements should be of supplementary nature, i.e. specify the previously collected data. This solution is supported by e.g. ensuring continuity and comparability of the collected data along with their higher usefulness for the needs of innovation policy. This goal can be achieved by:

- recording expenditure on innovation activities in terms of value for all innovation types and maintaining the existing level of data aggregation (total expenditure for product and process oriented innovation),
- distinguishing the outlays on these processes which were successfully completed, continued or abandoned from total expenditure on innovation activities,

- introducing the additional measurement of innovation activities' effects in the form aggregated for all its types.

The CSO statistics – as indicated – allow identifying the amount of expenditure on product and process innovation considering outlays on the particular innovation activity types. The actual expenditure on innovation processes is, however, larger since it also covers the spending on new or significantly improved commercial and organizational solutions. From the formal perspective there are no obstacles to include them in the reports on innovation in industry and service sector (tab. 1), even more so that in their case similar categories of expenditure on innovation activities can be present¹. It is equally important to obtain additional information about the amount of expenditure on successful, continued or abandoned innovation activities (tab. 1). In practice it is related to the decomposition of an item presenting total expenditure into the items grouping expenditure on implementation oriented innovation (successfully completed), potential ones (continued as a process) and the abandoned ones (permanently abandoned or interrupted in time). The structure of such expenditure should, obviously, be dominated by that successfully completed. It, however, should be remembered that the success in the Oslo Manual terminology is identified with the implementation of a new or significantly improved solution regardless of its commercial result. Therefore, it is worth analysing the results of innovation activities.

The measurement of innovation activities results, presented in the reports on innovation in industry and service sector is limited – as mentioned above – to identifying the sales share of new or significantly improved products in the total sales made by an enterprise divided into the novelty for the market and for the company. Such solution ignores other important results of the undertaken innovation processes in the process oriented, commercial and organizational sphere. This problem can be eliminated by using the Oslo Manual guidelines or presenting alternative proposals. In the first variant the results of innovation processes were measured separately for each type of innovation. Such approach does not seem founded, because process, product, organizational or commercial innovation can be implemented simultaneously. The more of them appear in the studied period the more difficult it is to determine their impact e.g. on the total net income value from sales. All calculations in this respect do not have a clearly defined algorithm and its absence causes that

¹ The category of preparation for marketing or organizational innovations also covers acquiring other external knowledge and machines, devices as well as other capital goods and also trainings related substantively to commercial or organizational innovations (OECD/European Communities, 2005).

various enterprises shall approach this problem differently (various, conventional statistical key figures). The data obtained in such way will be neither reliable nor meaningful.

Tab. 1: Expenditure on innovation activities referring to (product, process, organizational and commercial) innovation in a reporting year – the proposal of PNT-02 and PNT-02/u supplements

Specification		Expenditure in thous. PLN on innovation	
		product and process	organizational and commercial
Total		01	
Expenditure specification on the particular types of innovation activities (e.g. purchasing knowledge from external sources, purchasing software, investment outlays on fixed assets, staff trainings directly related with implementing a particular type of innovation etc.), in line with the CSO systematics in PNT-02 and PNT-02/u forms		02	
		03	
	...		
	...		
		13	
The funds out of total expenditure [Głuszczyk 2015]:	Innovation financing sources (e.g. own funds, received from the State budget, foreign funds – nonreturnable, private equity etc.) in line with the CSO classification in PNT-02 and PNT-02/u ² forms	14	
		15	
		16	
		17	
		18	
		19	
		20	
Innovation activities out of total expenditure	successfully completed	22	
	continued	23	
	interrupted or abandoned	24	

Source: authors' compilation.

Collecting aggregated data seems a different and better solution since it allows specifying the overall impact of various innovation types on an enterprise performance e.g. at the level of net income from selling products, goods and materials. In this case the total estimation would cover net income in a reporting year (e.g. 2015) earned as a result of implementing (process, product, commercial and organizational) innovations, which were introduced by an enterprise in the recent three years, including the analysed year (e.g. 2013-2015). Such data should be supplemented by recording changes in work productivity measured by the ratio of net income on sales (products, goods and materials) and the number of employees, because all new or significantly improved solutions should result in this ratio improvement.

² Głuszczyk offers an alternative proposal for classifying the sources of innovation financing in the article entitled *Financing innovation activities of enterprises in line with the Oslo Manual guidelines and the CSO practice* (Głuszczyk, 2015).

Conclusions

The purpose of the article was to evaluate the Oslo Manual 2005 guidelines referring to collecting information about innovation processes in companies and the level of their reflection in the procedures applied by the Central Statistical Office (CSO) along with presenting possible recommendations.

The critical analysis of the Oslo Manual guidelines, in terms of collecting data about innovation processes in enterprises, confirmed that the discussed guidelines are not free from flaws. Among them the following can be listed:

- grouping expenditure on processes referring to implemented, potential and abandoned innovation without breaking down these data into the listed groups,
- collecting data in subjective presentation,
- sharing rough percentage estimates by enterprises (e.g. approximate sales share resulting from new or significantly improved products in enterprise total sales),
- separate measurement of innovation activities results for various types of innovation (process, product, organizational and commercial ones).

The comparative analysis of procedures recommended by the Oslo Manual and applied by the Central Statistical Office related to collecting information about company innovation processes showed that in Polish statistics:

- not all expenditure on innovation processes is identified (expenditure related to the activities undertaken for the needs of commercial or organizational innovation disappears from the sight of public statistics),
- the expenditure on processes referring to implemented, potential and abandoned innovation are grouped without breaking these data down into the listed groups,
- the results of process oriented, organizational and commercial innovation activities are ignored.

The discussed defects seem to repeal the recommended changes in terms of collecting data about innovation activities carried out by enterprises.

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