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# EFFICIENCY ISSUES IN POLAND'S RESEARCH INSTITUTES

## Summary

The article aimed to specify the complexity of assessing the management's efficiency of research institutes in Poland, in the context of the implementation of tasks resulting from their principal and ancillary activities, as well as other assignments commissioned by public administration authorities. The author attempted to clarify the concept of efficiency by reviewing the subject literature, to find a standard unit to assess research institutes' activities in terms of efficiency. The analysis carried out based on a literature review, taking into account the complexity of duties of the research institutes, showed that there was no ultimate typology of efficiency, as research establishments have been set up to carry out a broad range of tasks of an economic, social and scientific nature. For that reason, efficiency can be only assessed against the priority, principal, and commissioned tasks implemented by each institute.

**Keywords:** efficiency, efficiency analysis, efficiency categories, research institutes.

**JEL Codes:** D21, H11, I23, D61

# PROBLEMATYKA EFEKTYWNOŚCI INSTYTUTÓW BADAWCZYCH W POLSCE

## Streszczenie

Celem rozważań jest przybliżenie złożoności pomiaru efektywności zarządzania instytutów badawczych w Polsce w aspekcie realizacji zadań wynikających z działalności podstawowej, pomocniczej, jak również innych zadań zleconych przez organy administracji publicznej. Autor przybliży pojęcie efektywności dokonując przeglądu literatury łącząc to z próbą znalezienia wybranej jednostki pomiaru efektywności działalności instytutów badawczych. W wyniku analizy literatury oraz złożoności zadań realizowanych przez instytuty badawcze, autor wnioskuje, że nie ma jednoznacznej typologii efektywności, bowiem jednostki są powoływane w celu realizacji różnorodnych zadań o charakterze ekonomicznym, społecznym oraz naukowym. Tym samym efektywność każdego instytutu może być oceniana przez pryzmat priorytetowych oraz podstawowych i zleconych zadań.

**Słowa kluczowe:** efektywność, analiza efektywności, kategorie efektywności, instytuty badawcze.

**Kody JEL:** D21, H11, I23, D61

## Introduction

The current legal status of Poland's research institutes was introduced in 2010 (Act ...2010). Before, they had operated as research and development units in the public finance sector. Notwithstanding the change in the position held by research institutes as determined by Polish law, they have not changed their principal activities, i.e. those related to the purpose of their establishment. Even though the institutes carry out research and development works aimed at the implementation and application of the results in practice, their focal tasks are often related to societal purposes such as digitisation, health, environmental protection, defence, sport, or food security. Poland's research institutes conduct studies concerning nearly all sciences, including engineering as well as natural, agricultural, medical, and social sciences. Likewise, activities carried out by the institutes are differentiated. It is not uncommon that the institutes are non-technology transfer-oriented entities, conducting primarily expert-type activities for the needs of public administration. This is particularly true for the institutes involved in research related to social sciences. The medical institutes with the main activity of providing medical services constitute a separate group (Sejm Rzeczypospolitej Polskiej 2018). Alterations in governmental policy, growing social needs, as well as changes resulting from incidental events such as a war in a neighbouring country or pandemics, have led to dynamic modifications of the tasks carried out by individual research institutes. Their leaders have to regularly make needed adjustments in the implementation of the adopted management strategy through the allocation of human, financial, material, and information resources. Some external factors imply the need to make immediate decisions, to re-evaluate objectives that affect the efficiency of the implementation of individual tasks or groups of projects. The decision-making process must take into account several complex considerations and factors that relate to making the right choice. In practice, managers most often focus on what is feasible, wrongly assuming that everything depends mainly on their attitude, knowledge, willingness, and motivation. Overlooking or marginalizing factors beyond one's control can be a serious mistake (Walczak 2012).

The research institutes have been established to carry out the tasks related to the principal activities, i.e. conducting research and development works, providing practically relevant research findings, and implementing the obtained results of research and development works. Additionally, they may carry out a range of ancillary activities. Pursuant to the Act on Research

Institutes (Act...2010), some research institutes perform tasks commissioned by the government (prime minister, supervising minister) or by other public administration bodies. Funding for the activities of research institutes comes from grants, subsidies, sales revenue, and other sources of income. In choosing an effective management strategy, the major challenges for both the institute managers and the supervising ministers are: on the one hand an assortment of activities (scientific, economic, societal), and on the other – the diversification of revenue streams. Changes in governmental policy and required adaptation of measures to dynamically changing global situation do not make the process of the strategy implementation any easier, and therefore, the assessment of the efficiency of the institutes as a whole turns out to be extremely complicated.

According to Mankiw and Taylor (2009), efficiency means that society obtains as much as possible from its resources.

Correspondingly, Samuelson and Nordhaus (2000) state that efficiency follows when there is no waste and, in the case of the efficiency of production (production efficiency), it occurs when “the society cannot increase the production of one good without reducing the production of another one.”

According to Szymańska (2010), traditional methods have become increasingly insufficient because they do not allow for a comprehensive assessment of the organisation, which could explain all the causes of possible irregularities. Therefore, the efficiency assessment model should be adapted to the type of activity conducted and additionally modified in terms of the needs of a specific organisation. This statement justifies the development of an individualized model for measuring the efficiency of research institutes in Poland. The diversity of the institutes' activity profiles is very large. There are practically addressed issues in all the areas of activity in the country. Some research institutes carry out complementary (ancillary) activities, whereas others form specialized universal national units. Thus, analysing the efficiency of the research institutes requires a multidimensional assessment and analysis.

## Research methods

The analysis presented in this article employed the observation method, categorized as primary research, and descriptive methods, categorized as secondary research known as desk research. The conducted observations facilitated the analysis of the conduct of research institutes, whereas desk research allowed

for a descriptive analysis of the investigated institutes and the formulation of the concept of efficiency. Secondary research incorporated literature concerning the broad concept of efficiency. Both English-language publications and reports from the institutes were used for textual analysis. Furthermore, materials from specialist journal articles and websites were subjected to analysis. As part of the source investigation, a critical content analysis was conducted, and existing data was scrutinised.

## Issues of the concept of efficiency

The supervising minister and other entities directly and indirectly supervising the research institutes require that all the tasks are carried out as effectively as possible. This may be quite difficult to achieve, not only due to the instability of economic and political circumstances or dynamic scientific developments but also because of the lack of common understanding what is the efficiency of the research institute. The problem lies in the proper definition of the term efficiency, the unambiguity of which has not been conclusively defined in management sciences.

The definition of efficiency is formulated depending on the subject of the study concerning a given issue. Thus, in the case of management of an entity, the term efficiency refers to the effectiveness of the implementation of a particular strategy and a set of goals to be achieved. Efficacy is a measure of efficiency and effectiveness, a measure of how well one achieves set goals (Stoner, Freeman, Gilbert 1997). In the case of production, efficiency is understood as the maximum utilisation of production capacity in relation to the product obtained or else the achievement of customer satisfaction or employee satisfaction (Daraio, Simar 2007). There exist other definitions of efficiency which are referred to in the following sections of this article.

In the case of the research institutes, from the point of view of their management, efficiency should be considered not only as the reliable implementation of the tasks entrusted but also in terms of meeting societal needs or fulfilling the principal function for which a given research institute was established.

To verify the efficiency of scientific institutions, several studies have been carried out based on efficiency analyses using the slacks-based measure (SBM) model – a component of the non-parametric Data Envelopment Analysis (DEA) methodology (Brzezicki, Prędko 2023). Other published analyses included

a comprehensive review of research concerning Polish higher education, conducted with the use of DEA and the Malmquist index (Brzezicki 2020). Regrettably, the obtained results confirmed low efficiency levels and showed the lack of a unified research approach to education. Similarly, Łącka and Brzezicki (2020) showed very low or low efficiency in most Polish technical schools.

In the study by Wolszczak-Derlacz (2013), it was concluded that Polish universities did not use staff and financial resources efficiently, and a degree of inefficiency was significant.

The ineffective use of the research institutes' potential was confirmed by the results of the Supreme Audit Office, whose conclusions indicated that in 2010–2013 (SAO 2014):

- the institutes were negligibly engaged in implementation activities, even though this was their statutory duty,
- an increase in patented inventions did not translate into a corresponding increase in invention implementations,
- revenues from commercialization of research and development (R&D) work showed a decreasing trend,
- the activities of some institutes consisted largely of highly specialised, but routine, work for public administration and business entities.

In addition to critical comments resulting from the review of literature and studies conducted both by scientists and the State supervisory and control institutions, the assessment of management efficiency should take into account the scientific, developmental, and economic aspects of activities carried out. The research institutes play a significant role in the fulfilment of the State's needs, which does not always have to be economically beneficial, but the tasks should be efficiently accomplished.

## **Scientific or business perspective on efficiency?**

The ambiguity in defining efficiency in the subject literature causes dissatisfaction and encourages guesswork to undertake any considerations on this topic, thus appropriate specifications must be made each time. This is even more necessary given the need to recognize efficiency multidimensionality (Kwarcińska 2018). In reference to the above, it should be stated that the concept of efficiency must be redefined each time in the variable economic model taking into

account the situation and human activity – dependent on the period when the analysis is carried out.

The term efficiency can refer to the economy, enterprise, process, finances, decisions, management, investment, and so forth (Kardas 2018). The multidimensionality of efficiency can refer to many aspects of studies conducted and focus on both macroeconomic and microeconomic elements. This, in turn, results in a wide research spectrum and somewhat limits the researcher's ability to verify all study areas.

The word efficiency comes from the Latin word *effectus*, which means act of effecting, completion, or performance (Kumaniecki 1974). Other linguistic analyses show *effectif* in the French language, which means one who has or can have an effect, a positive real effect, concrete (Greimas, Keane 1992). Likewise, the German word *effectiv* means factual, real, profitable, producing a result (Baer 2000).

Based on the above, it can be deduced that the word efficiency has retained its meaning from its ancient form to that adopted today. Its original connotation referred to performance and effectiveness; today we would rather say efficient performance, efficient implementation of an activity leading to a definite goal. Given that the activity is performed by a human being, we can make the term a little more specific. Consequently, we may be tempted to say that a conscious and intentional human action to achieve a result can be efficient. According to Przychólkowski (1978), efficiency refers to some category of action, i.e. human behaviour that is purposeful, conscious, arbitrary, and as such is intended by a person undertaking a given activity to achieve specific results and effects of this action. Within the scope of the present study, efficiency is referred to in terms of management activities, and further discourse is conducted according to this etymology.

In the formulation of the efficiency typology, resource scarcity implies limited capacity to meet requirements as well as calls for appropriate production choices and attention to the efficiency of operations (Kozuń-Cieślak 2013). Indeed, we are dealing with the typical resource scarcity of our time. When resource scarcity is marginal, one may be tempted to say that the situation does not affect the production process and ultimately the efficiency of operations. The situation may be different when there occurs such a far-reaching reduction in resources that any measurement of efficiency becomes impossible, as it would be quite problematic to assess the efficiency of management staff, equipment, and other resources if the study subject did not exist and, consequently, the ability to measure the effects was blocked.

In line with the classical economy, on the other hand, only the so-called ‘invisible hand’ of the market enables the efficient allocation of resources through freedom in management. Neoclassical economics introduced the concept of allocative efficiency, i.e. the movement of resources in a way to produce more of a good at relatively low production costs. This concept was introduced by W.F. Pareto (1848–1923), who used it in his studies on economic efficiency and income distribution. Pareto efficiency refers to the situation where the allocation of resources is efficient only when it is impossible to be changed in a way that would improve the situation of some without worsening the situation of others (in Kundera 2004). Pareto defined efficiency in the context of the economy as a whole and consumers who represent a community as a whole. The model concerned the total consumption of all market users, all production resources, and the analysis of exchange between buyers and sellers. Confirmation of the proper implementation of wealth allocation is provided by studies carried out by Ouattara (2012), who concluded that national savings are a factor in economic inefficiency. The government should sensitise the public on the legitimacy of mobilising savings to provide greater support to enterprises that can add value through better use of resources and provide jobs. At the same time, Loxley and Sackey (2008) point out that more indebted companies are less technically and economically efficient, and this is because the burden of liabilities with certain suppliers undermines efforts to strategically manage the business and invest in production capacity.

The concept of efficiency can be defined by separating components caused by technical reasons from those caused by poor choice. Technical efficiency measures how a company chooses the number of inputs used in the production process and achieves the most favourable ratio of inputs to the market price considered competitive. Any change that seeks to increase the value is considered to be efficient, whereas a change that results in a decrease in the value is considered inefficient (Farrell 1957).

Most commonly, technical efficiency involves an overall assessment of an entity by comparison with other ones or else through reference to a productivity curve, with the use of mathematical and econometric methods (Ziębicki 2013).

The DEA method can also be used to determine the technical efficiency of various entities. In the study by Kulik (1997), a detailed analysis was made of the non-parametric method (DEA) for examining technical efficiency, and the procedure for calculating the relative efficiency index was presented as an example. Various modifications of the DEA method were also indicated, as well as the areas in which it can be used (Kulik 1997).



A resource allocation approach is presented in the studies by Koopmas (1953), who introduced the concept of activity analysis. The author addressed the problems of efficient production planning, rejected the traditional approach to the production function, and argued that in production the most important factor was the choice of technology and resources. From this point of view, the most efficient transformation of resources means the allocation of resources that satisfies both consumers and producers (Kundera 2004). In addition, worthy of mention is another important contribution of Koopmans (1951) to economics, i.e. the characterisation of the efficient point in the commodity space.

On the other hand, however, K. Wicksell (1851–1926) – a Swedish economist of the Stockholm school – disagreed with the concept of maximising profits while minimising costs. This author described two forms of efficiency optimisation, i.e. maximising the effects or minimising the inputs. It is not possible to perform the two aforesaid forms simultaneously, as they are logically contradictory. Therefore, the author described the efficiency principle as the formal maximisation principle, while the realisation of savings is the rule of least means (Bochenek 2016).

A somewhat different approach is shown in the definition presented by Winkler (2010). In this definition, the term efficient refers to an aspect of reality, that is not only specific, measurable and related to a certain action (understood as an intentionally initiated process or transformation), but also achieves a considerable value as compared with other reality aspects of a similar type, when appraised with the use of a specific assessment criterion and a specific way of valuing the obtained results attributable to this criterion. In consideration of efficiency defined this way, the use of the alternative term 'rational' seems understandable. Then again, according to Leszczyńska (2004), the defined meaning of the term efficiency is often overlooked in scientific studies, and thus – misused. When considering the use of the term efficiency, it is important to bear in mind the related field of science. The term needs a specific connotation in management sciences, and it will be subject to slightly different strands of interpretation in human sciences. Efficiency is not only related to the themes of research in the field of management sciences but also those concerning economics and praxeology. Taking interpretative caution for this article, it seems more correct to use the term efficiency to distinguish it from the term rationality.

Some authors interchange the term efficient and use synonymous words such as productive or effective. In an analysis of 'efficient' (in terms of productivity),

there should be considered a degree of implementation of planned activities or set goals, i.e. the context of operational effectiveness (Kozioł 2004).

Even so, it is not always possible to automatically agree with the use of alternative words, as an action may be effective but not always intended. Of course, in the case of management sciences, we usually refer to an efficient action that involves human labour in a specific period, carried out with the use of specific means. In the subject literature, there have been described studies concerning human labour efficiency, time efficiency, or resource efficiency. The analysis and interpretation of the constellation of professional suitability traits may be the basis for the creation of psychological profiles used to forecast the efficiency of human work (Ronginska 2012). The term 'time efficiency' can refer to the time of intended machine on-load operation (Kokoszka, Tabor 2006), and 'resource efficiency' can depend on the production methods applied (Börjesson, Mattiasson 2008).

This is just an example of how universal the meaning of the term efficiency is, on the one hand, and, on the other – how careful one has to be when concerning the use of this word in the context of a given economic model.

Efficiency is a somewhat relative and unstable concept, as it is usually referred to in the present time to describe actions that took place in the past. A separate issue is the evaluation of rational decision-making and acting in good faith. In this case, we examine the efficiency of decisions taken in preceding years in the context of evaluating their efficiency or rationality. This issue is quite often raised in terms of evaluating managers or day-to-day decisions in people's lives. As a matter of fact, under certain conditions, decisions are initially taken to achieve a given objective, but over time, the action proves to be ineffective or exceeds the objective to be achieved as assumed earlier.

A comparable opinion was expressed by Borkowski (2021), who stated that regardless of numerous analyses presented in the subject literature, there still did not exist (and probably never will) a coherent, universal, and universally accepted definition of efficiency. A consequence of the lack of a distinct, well-defined description of efficiency – both on micro- and macroeconomic scales – is a range of approaches to measuring this aspect (Borkowski 2021). This statement is quite essential as an analysis of both the up-to-date literature, and that from preceding years indicates a wide range of interpretations of the meaning of the term efficiency, the result of which is lacking consistent interpretation.

The organisational efficiency is inconsistently identified by researchers who seek different models applicable to changing contexts. At the beginning of the 21st century, materials were presented at academic conferences that

signalled studies of several authors working on this issue (Abston, Stout 2006). An attempt to define organisational efficiency was made by Steers (1975), who reviewed 17 multidimensional models of organisational efficiency in terms of their basic evaluation criteria, normative or descriptive nature, generalisability, and origin. The models included the following criteria: adaptation-flexibility, productivity, satisfaction, profitability, resource acquisition, absence of organisational tension, control over the environment, development, efficiency, stable employment, growth, integration, open communication, and survival. The researcher proposed that the aforementioned criteria facilitated and stimulated more rigorous attempts to measure and explore the concept of efficiency in organisations (Steers 1975).

An extensive model incorporating efficiency was put forward in research by Campbell (1979), who defined 30 criteria: absenteeism, accidents, performance emphasis, conflict-consistency, control, efficiency, evaluations by external persons, flexibility-adaptation, goal consensus, development, information management, and communication, internalisation of organisational goals, job satisfaction, manager's interpersonal skills, manager's task skills, morale, motivation, overall efficiency, participation, and collective influence, planning and goal setting, productivity, profit, quality, readiness, conformity of roles and norms, stability, emphasis on training and development, turnover, use of the environment, the value of human resources (Campbell 1979).

A different perspective on efficiency was provided by Leibenstein (1966), who studied organisational inefficiency. This author reviewed the empirical evidence, especially with regard to the theory of firms and the explanation of economic growth. According to this author, microeconomic theory focuses on allocative efficiency, neglecting other efficiency types, which in fact in many cases are much more important. In the studies by this author, non-allocative efficiency was presented in the context of the use of resources, skills, and technology. In later studies, this organisational efficiency has been referred to as X-efficiency.

Failure to take into account all factors and conditions at different organisational levels, or inappropriate selection of the tools to be implemented, may render the action taken uneconomic. It is extremely important to distinguish between expenses related to the rational incurring of costs and the irrational incurring of losses (Byłeń 2019).

Moreover, several authors have signalled in their studies a new perspective on the concept of corporate efficiency, which can be considered in two aspects: organisational and economic (Gerlach, Gil 2018). Organisational efficiency has

been defined as the ability of an enterprise to adapt, on an ongoing and strategic basis, to changes in the business environment, as well as to use its resources productively to achieve the adopted structure of goals (Szymańska 2010).

Economic efficiency, on the other hand, is expressed as a course of action to achieve the highest degree of goal realisation with a given input. Efficiency can be increased by minimising inputs or maximising outputs (Bielawa 2013). A similar view of efficiency is presented by Borowski (in Wojdalski et al. 2020), according to whom efficiency is the result of economic (industrial) activity, which is the ratio of the effect obtained to the outlay incurred. Consistent with Bieńkowska (in Skrzypek 2010), efficiency is the achievement of the highest possible results of an organisation's activities at the lowest possible costs related to its functioning.

Skrzypek (2002), on the other hand, understands efficiency as the ability to implement the company's strategy as well as to achieve specific goals. The author points out that efficiency can be defined as, *inter alia*, a positive result, efficiency, efficacy, skill, a key to increasing the competitiveness of an enterprise, a fundamental element of human and organisational development, a speed of response to challenges and expectations of the market, a necessity – in the unstable business environment – rather than a problem of choice, the ability to implement the company's strategy and achieve well-defined goals, an important tool for measuring the efficiency of management of any organisation, productivity, effectiveness or functionality, a process of development, an interactional process involving phenomena inside and outside the organisation (Skrzypek 2002).

Given the above, it seems necessary to accept the statement that efficiency is the effectiveness and efficacy of operations in terms of incurred costs and expenditures to achieve effects and predetermined goals. According to Griffin (2021), efficiency is production and operation carried out with the least possible waste of raw materials, and efficiency is taking appropriate actions aimed at achieving success.

In recent years, there has developed the concept of the importance of maintaining a balance between employees' personal and professional lives which influences work efficiency. An example of an analysis is a study by Walentek (2019) who examined the influence of selected competencies and attitudes of employees on shaping efficiency at work. The author draws attention to the effects of employee fatigue, relationships with other employees, praise and recognition from the superior, and the possibility of rest from work on staff work efficiency and, consequently, on the entire organisation. Overall employee motivation can

be linked to higher productivity, production quality, and business results (Jelačić 2016). The work-life balance has been described in Maslow's theory and Glasser's theory, which assume that the whole human behaviour aims at satisfying his or her basic needs (Kropivšek, Jelačić, Grošelj 2011). On the other hand, knowing a person's needs profile can help create the basis for adopting the right approach to effective and efficient leadership (Kropivšek, Rozman 2007; Jelačić, Galajdova, Sujova 2007). On the other hand, however, working effectively can be inefficient, and efficient work does not have to be effective (Sidor-Rządowska 2015). Furthermore, humanisation of work is understood as a set of activities aimed at increasing the level of social efficiency of work by maximising the achieved social goals of work and minimising the social costs of work, which also refers to increasing the social efficiency of work (Sołtys 1985).

In the case of investment and its efficiency measurement, in the subject literature, there prevail descriptions as regards obtaining the highest value of financial benefits in relation to the incurred expenses (Wrzosek 2008, Pastusiak 2012).

The social efficiency of economic development is understood as the ratio of the social effect of management to the existing economic potential (Bywalec 2005). In light of the above, a measure of social-economic efficiency can be constructed that expresses the ratio of the existing social resource to the total productive resource of an economy (economic system). This measure can be termed the ratio of the global social efficiency of the economy. Furthermore, the measure of the social efficiency of economics can be the factor of the current social efficiency of economics, which is the ratio between the current social effect of economics, expressed by the stream of means of satisfying needs (consumer goods) produced in a given period, i.e. the proportion of gross domestic product devoted to current consumption, and the economic stock, i.e. the level of development of the productive forces (Bywalec 2005). Therefore, societies should be oriented towards increasing social efficiency, which is a condition for long-term economic efficiency (Mroziowski 2014). Studies by North (2005) confirmed this view by formulating the concept of adaptive efficiency.

Organisational efficiency can be looked at in another way from four perspectives (Kaplan, Norton 2001):

- financial, which measures the current financial success of a company as a business;
- customer, which indicates the sources of success (market position and customer satisfaction);

- internal processes, which refers to the processes taking place inside a company;
- development, which defines the ability to change and further growth, on which the future success of the company depends.

This approach to the classification of efficiency seems to be quite common among employees, as it is a form of definition simplification. Employees can easily identify with the above perspectives and implement corrective actions to maximize results.

## **Research institutes in Poland – quantitative overview**

In Poland, as of 15 October 2023 (Polish parliamentary election<sup>1</sup>), there were 67 research institutes subordinated to 14 supervising ministers. For the most part, specific ministers have typically supervised 1–4 research institutes. The Ministry of Health has so far supervised the largest number (14) of research institutes. The next in rank are: the Ministry of Agriculture and Rural Development, who supervises 12 research institutes, the Ministry of Climate and Environment (10), and the Ministry of National Defence (9). A detailed analysis is presented below.

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<sup>1</sup> Polish parliament is the bicameral legislature of Poland. It is composed of an upper house (the Senate) and a lower house (the Sejm). The Constitution of Poland does not refer to the Parliament as a body, but only to the Sejm and Senate. The Constitution vests legislative power in the Sejm and the Senate, executive power in the President and the Council of Ministers, and judicial power – in courts and tribunals. Thus the Sejm shares its legislative function with the Senate; simultaneously, it is part of the governmental system in Poland. <https://www.sejm.gov.pl/english/sejm/sejm.htm>

**Table 1.** The number of research institutes supervised by Poland's ministries

No.	Name of the Ministry	Abbreviation	The number of supervised research institutes
1	Ministry of Sport and Tourism	MSiT	1
2	Ministry of Funds and Regional Policy	MFiPR	1
3	Ministry of Development and Technology	MRiT	2
4	Ministry of Education and Science	MEiN	2
5	Ministry of the Interior and Administration	MSWiA	2
6	Ministry of the Family and Social Policy	MRiPS	2
7	Ministry of the Interior and Administration	MC	2
8	Ministry of Culture and National Heritage	MKiDN	2
9	Ministry of Infrastructure	MI	4
10	Name of the Ministry	MAP	4
11	Ministry of Sport and Tourism	MON	9
12	Ministry of Funds and Regional Policy	MKiŚ	10
13	Ministry of Development and Technology	MRiRW	12
14	Ministry of Education and Science	MZ	14
	Total		67

Source: own elaboration.

In Poland, the research institute is established by the regulation of the Council of Ministers, and it is supervised by the responsible minister specified in the regulation at the stage of launching a given institute. Changes resulting from government policy may lead to a revision of the name of the ministry, or ministry division, or a change in the way of the institute's supervision. The present study refers to the names and subordination of Poland's research institutes right before the parliamentary election held in October 2023. Act of 4 September 1997 on governmental administration sections (Act... 1997) which defines the tasks and powers of competent ministers, inter alia, as regards the supervision over the research institutes has been amended more than 150 times, in the

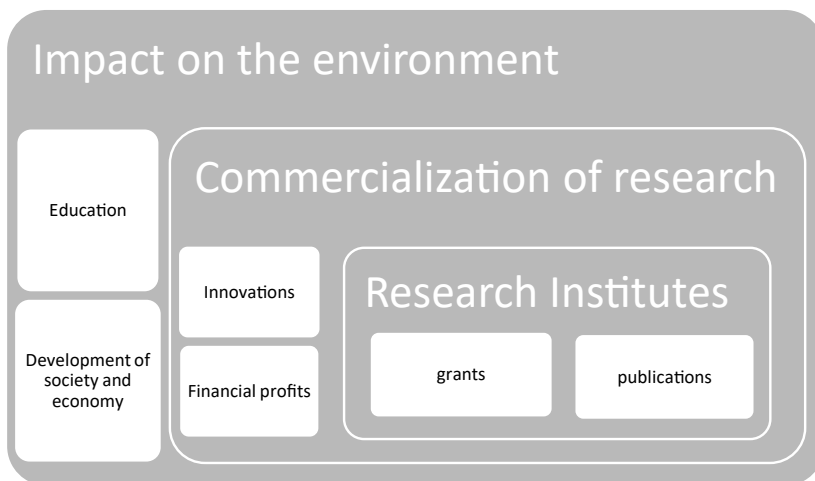
period from its adoption to September 2023. Not all alterations have had an impact on the research institutes, but several changes both in legislation and in the management of ministries illustrate the enormous variability that might have an indirect impact on the activities of the institutes.

Changes in the scope of supervision may also result from the likelihood of merging or dividing, establishing or liquidating, both the ministries and the research institutes. All these changes indirectly affect the management strategies of the institutes and force changes in the implementation of tasks related to the institutes' undertakings.

The activity report and the financial statement are some of the documents providing publicly available information about the business. The availability of up-to-date and reliable information is the basis for measuring efficiency, and if the provided information is incomplete, concealed, made available with a delay, or unreliable, an incorrect assessment of efficiency takes place (Dudycz 2017). Similarly to universities, to ensure higher efficiency, the research institutes should also implement systems ensuring high quality of scientific research and transparency of operation (Maciejczak 2016).

The multidimensionality of efficiency assessment in the research institutes is depicted in Figure 1.

**Figure 1.** Multidimensionality of efficiency assessment in Poland's research institutes



Source: own elaboration.



## Conclusion

In the context of Poland's research institutes, efficiency is an issue with many aspects and dimensions, which is confirmed by the presented analysis of scientific literature. The lack of a clear definition of this concept seems a common problem and, at the same time, constitutes a challenge for the management staff of these institutions. Therefore, it is important to define clear and detailed strategic goals based on which it will be possible to assess the efficiency and efficiency of activities.

The management staff plays a key role in running research institutes. The implementation of strategic goals is a basis for assessing the degree of completion of intended tasks as well as the achievement of planned effects. However, to carry out this assessment, it is necessary to determine what efficiency testing methods will be adopted. The properly developed and implemented method is the basis for measuring efficiency and making the final assessment.

It is worth noting that research institutes carry out a range of various tasks. This includes research projects of a social, scientific, economic, and organisational nature. Nowadays, especially in the context of global challenges, research institutes often are engaged in social activities, such as e.g. fight against the pandemic. This variety of tasks makes performance assessment even more complex and multidimensional.

Therefore, in the assessment of the research institutes, the approach based on the multidimensional measurement of efficiency should be considered. This means that efficiency cannot be limited to just one dimension, such as e.g. financial profit, the number of scientific publications, or the number of research projects. It is important to take into account various aspects of the institute's activities, such as its influence on society, innovation, education, and contribution to solving current problems. Multidimensional performance measurement can provide a more comprehensive assessment and better reflect the contribution of the research institutes to the development of science and society.

The conclusion is that managing the performance of Poland's research institutes is a task that requires attention, diligence, and flexibility. One cannot rely on a single universal definition of efficiency but must take into account the diversity of activities undertaken by the institutes and use assessment methods adapted to a specific situation. It is also important to remember that striving for multidimensional measurement of efficiency may contribute to a better understanding and assessment of the role of research institutes in society and science.

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