

PUBLIC AID IN FINANCING INNOVATIONS IN POLAND: THE OPERATIONAL PROGRAMME 'INNOVATIVE ECONOMY'

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Abstract

Public aid is nowadays an important instrument of the state's intervention mechanism. Redistribution of public resources directed towards the convergence process, also in the aspect of innovation co-financing, is considerably meaningful for supporting competitiveness on the medium-level (for individual sectors) and macro-level as well (for the entire economy). Financing of innovative projects is of great importance in carrying out effective state policies, including the innovation policy. The article focuses on the possibilities of providing financial support for innovations by application of various types of public aid. It also emphasizes the status of the Operational Programme 'Innovative Economy', the implementation of which has been assessed based on analysis of indicators of selected priority axes.

Keywords: *innovation, public aid, innovative projects, innovative projects financing.*

1. Introduction

The formation of a durable and sustainable socio-economic development has been a challenge for contemporary state authorities. They are responsible for setting up the conditions that support sustainable development and mitigate the effects of economic shocks. The policy for innovation support is one of the components of the general state's policy. Intervention in the form of public aid for innovations is considered to be indispensable for effective functioning of the economy and for supporting competitiveness, and as such it complies with the Treaty on the Functioning of the European Union.

The Operational Programme 'Innovative Economy' (OP IE) holds the key position among the available public aid instruments for innovation project

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financing. The OP IE's strategy assumes financing of projects within the scope of research and development, new technology investments together with the infrastructure as well as development of competences of human resources which are crucial for implementation of the innovative projects. All these actions impact the strengthening of competitiveness in the international market.

This article aims to present the types of public aid for innovative projects offered, especially the Operational Programme 'Innovative Economy', and an analysis of the obtained indicators for selected priority axes.

To achieve the main goal, the following hypothesis will be verified: *public aid offered within the framework of the OP IE has been the biggest source of innovation financing in Poland over the period 2007-2013. However, the level of innovative projects implementation, as measured according to the indicators of product and result, does not reflect the assumed effects.*

This paper consists of four chapters. The focus of the first two is the theoretical aspects of innovation and public aid. The third and fourth chapters are based on empirical research and present the structure of the OP IE, allocation level, implementation level as well as an analysis of the indicators of selected priorities during the period 2007-2012.

The discussion on innovation financing within the framework of public aid is based on literary reviews and an analysis of programme data and reports. Additionally, an analysis of results obtained up until the present, as compared to the assumed levels, has been conducted and the implementation level has been examined. Last but not least, the representatives of a seed capital fund were interviewed using the Individual in-Depth Interviewing technique.

2. The nature and types of innovations

The unceasing process of evolution is particularly determined by the continuous drive towards perfection. Man refines the surrounding environment or creates new things to meet the growing demands of people. Some people succeed in inventing or creating something that is nowadays called *an innovation*. Some commonly known examples of such innovations are: Thomas Edison's light bulb, Alexander Graham Bell's telephone, the Internet, the cell-phone, etc. The word *innovation* (Latin: *innovation*) means renewal, novelty. Currently innovations are within the focus of attention of the theorists of economics, researchers of economic sciences, entrepreneurs, managers, politicians and consumers. It is proved when considering the increasing volumes of publications, books, magazines on innovation and new technologies development and the strategies being formulated by regional and central authorities (Świtalski, 2005, s. 78).

There is no unified definition of the term *innovation* in economic literature. The precursor of the theory of innovation was 18th century economist J.A. Schumpeter. He claimed in his works that economic development is stimulated by innovation in a dynamic process, in which old technologies are replaced by new developments. He focused mostly on technical innovations and their impact on the economy. He considered innovations implementation and their dissemination to be separate types of change that he called imitation (Dolińska, 2010, s. 16). It is noteworthy to mention that Schumpeter's theory applies to a capitalist economy, where land and production play considerable roles and factors such as knowledge and information were taken into account to a much less extent (Pomykalski, 2001, s.12).

In his work "Theory of Economic Growth" Schumpeter enumerated five types of innovations (Schumpeter, 1960, s.104):

- creation of a new product,
- introduction of new production method,
- opening of new markets,
- acquisition of new resources or semi-finished goods,
- introduction of new organization of production.

There are various approaches towards the definition of the term *innovation*. Two of them should be mentioned. The first one, so called broad approach (coined by J.A. Allen, Ph. Kolter or E.M. Rogers, among others), sees the nature of innovation as a perception of products or processes as new (Kolter 1994, s.322; Rogers 2003, s.12). Additionally, J.A. Allen emphasizes the strict relation between innovation and implementation for common use of a new product, process or a certain way of conduct (Allen, 1966, s.7). The second approach, so called narrow, suggested by Ch. Freeman for example, narrows down innovation to the first commercial introduction of a new or enhanced product, process or system (Freeman, 1982, s.7).

S. Kuznetz defines innovation as a new application of an old or new knowledge for production processes that initiate implementation of an invention. Similarly, L. Białoń defines innovation as implementation of new products production, triggering of new technological processes and organizational systems with the aim to increase effectiveness of administration (Białoń, 2010, s. 15-16).

A. Pomykalski represents the synthetic approach, according to which innovation is a process that encompasses all changes in activities related to creation of an idea, invention and then implementation of the new or improved product, process, organization or service (Pomykalski, 2001, s 25). He notices that innovation is not exclusively only an invention, it may be also a certain kind of modernization of a product, service or process, which, as a consequence, improve the effectiveness in the performance of the enterprise.

Most of the above mentioned authors of the innovation definition adhere to the point that it consists in creation of a new product, with an emphasis on change. So does it mean that every change is an innovation? Rather not! However, it is certain that each innovation is a change. Certainly, innovation is something new, but is every novelty an innovation? Or maybe innovation should be considered as a certain kind of a “breakthrough”? Such dilemmas have not been precisely explained which leads to an over-usage of the term.

In the era of domination of a knowledge-based economy, the most widely accepted definition of innovation is the one proposed in the *Oslo Manual*. “An Innovation is the implementation of a new or significantly improved product (a good or service), or a process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations.” (Oslo Manual, 2008, s. 48).

The definition set forth by OECD clears away much of the confusion that arose within the time span of the last few decades. It points out explicitly that not every new solution is an innovation because it requires a practical application. Even more so, not each innovation needs to be a novelty *sensu stricto*. It depends on the novelty of the development and on the diffusion (Bukowski, 2012, s.3). The OECD definition implies also that there are four different types of innovation to be distinguished: product, process, marketing and organizational innovations.

Product innovation is the introduction of a new or significantly improved in its characteristics or applications product or service. The improvements may relate to: technical specification, components, materials, software, use-facilitation or other functional characteristics.

Process innovation is related to implementation of a new or significantly improved method of production or method of delivery. These may include improvements in: technology, appliances or software and can aim at decreasing cost production per unit, delivery or quality improvements.

A marketing innovation stands for the implementation of a new marketing method that involves changes within production/construction of product or in packaging, distribution, product promotion, pricing strategy. It aims at increasing sales by better addressing customer’s needs or new product positioning on the market.

Organizational innovation is the implementation of new organizational methods in actions and procedures of an organization or a firm. Such innovations aim at reducing administrative and transactional costs, increasing work satisfaction, which, in consequence, should lead to the firm’s improved performance (Oslo Manual..., 2008).

Table 1. presents a classification of innovations according to various division criteria

Criterion of division	Type of innovation
Causes of origin	demand-related supply-related
Place of application	within the firm within the market environment of the firm
Uniqueness of the solution, dimension	radical (pioneering) imitative (adaptational)
Origin related to ownership of innovation	of the firm external as a result of cooperation between firms in the innovation process
Ways of development and implementation	system-like, developed according to existing procedures individual
Result of execution of specific process tasks	idea for new solution solution concept innovation implemented in the firm as a product of market sale.

Source: M. Dolińska, *Innowacje w gospodarce opartej na wiedzy*, Polskie Wydawnictwo Ekonomiczne, Warszawa 2010, p.21.

Nowadays, innovations play a significant role in all sectors of free-market economies. They are the basis for maintaining position in the market and for distinguishing the firm as well as for increasing its competitiveness with other companies. Innovations influence the socio-economic development on macro and micro-scales. Additionally, they shape the level of development of the economy, economic condition and competitive position against other countries (Dolińska, 2010, s. 21).

While discussing the theoretical and practical aspects of innovations, it is also crucial to pay attention to the distinction between the notions of innovation and innovativeness. The definition of the first one has been discussed in chapter 1. Innovativeness, on the other hand, denotes the ability to generate innovation.

After joining the European Union (EU), Poland, as did other Member States, became subjected to the EU innovation policy as set forth in the Lisbon Strategy. Its aim was to effectively use the available resources such as work, knowledge, capital and environment, and to shape the new competitive advantages of the EU economic zone. The result of periodical assessments of the Strategy implementation has been the recommendation by the European Commission to introduce the Competitiveness and Innovation Framework Programme (2007-2013). The goal of this programme is to support innovative actions, improve access to financial resources and support enterprises on the regional level (Dolińska, 2010, s.43).

3. Types of public aid for innovations

The theory of state interventionism, assigned to one of the best known world economists J.M. Keynes, is considered as one of the most important economic theories. It exemplifies market imperfections and the necessity to take up actions by the state to mitigate demand shocks (Keynes, 1960).

Within years, the state interventionism theory has been increasingly applied. Public aid is the result of these changes. It consists of the selective application of economic policy tools to specified subjects. It is an instrument for fulfilment of goals of state policy in a specific country (Jaźwiński, 2007, s.85). It integrates activities that shape durable and sustainable socio-economic development.

Public aid is a wide term that encompasses a multitude of forms. Most often it implies the granting of financial advantages to firms and is accompanied by financial expenses on the part of the public budget (Choroszczak, 2009, s.11). It consists of spending public resources or decreasing public impositions in order to support firms or production of specific goods and, thus, becoming an economic advantage for the beneficiary.

The characteristic of “selectiveness” is at the core nature of public aid and this means that it is granted to selected firms and thus it creates advantages for one firm at the expense of another (Michalik, 2011, s. 180). It is important that the amount of aid granted is not overused in relation to needs as in such cases the aid may exert a de-motivating impact on competitive firms.

The granting of public aid is regulated by European law. The European Union, based on the article 107 of the Treaty on the Functioning of the European Union, enumerates the following circumstances for granting public aid (consolidated version of TFEU, art. 107):

- it has to be granted from public resources,
- it gives privileges to specified subjects or production of specified goods and provision of selected services,
- it is an economic advantage for beneficiary, that threatens or intrudes the competitors,
- it impacts trade between the EU Member States.

Aid may be considered to be public aid when all these conditions are cumulatively met. The Treaty generally prohibits granting public aid to Member States while at the same time enumerates exceptions. The allowable public aid is a kind of compromise between the European Commission and the Member State that considers granting it. It is very often a successful tool to reach goals that are of common interest to both, and in certain conditions it may eliminate any malfunctions and barriers in the market, while improving operations and competitiveness (Podsiadło, 2011, s. 67, 69). The public aid

granted by Member States, including the one offered in the framework of EU funds, is monitored on a permanent basis by the European Commission.

In literature written on the subject, as well as in statistical sources which are the basis for the most important state reports and European Commission reports, Community assistance is unequivocally classified as public aid. It is considered the most important economic, financial and legal instrument of the EU and the Member States. One can note in this context a certain paradox between the assumptions of European policy that aim to protect competitiveness and its main instrument, which is public aid that is specifically geared to subsidize activities (investment projects) (Famielec, 2011, s. 32-33).

Three main types of public aid may be distinguished, on the basis of the above-mentioned article 107 of the Treaty on Functioning of the European Union: regional aid – granted to the poorest regions; horizontal aid – granted to firms independent of location and sector, under the assumption that they undertake a specific action; and sector aid, directed to sectors that require support from public resources (Burzyński, 2008, s.25-28).

Public aid is a wide notion and for this reason the set of its instruments is not a finite one. Any aid that involves public financing is considered public aid, independent of type or form (Kozuch, 2011, s.75). European Commission reports present an interesting classification of forms for granting public aid and divides them into five groups: subventions and tax relief, capital-investment subsidies, soft crediting, warranties, guarantees, etc. (*Raport o pomocy publicznej...*, 2012).

There are many forms of public aid for research and development as well as for innovations. These may include: tax reductions (for example, if a firm is located within specific special economic zone), preferential credit terms or guarantees. However, the most significant form of public aid in the case of innovations, implementation of new technologies and R&D is direct investment in the form of subventions. Selected instruments of public aid directed towards financing of innovative projects are presented in Table 2.

The most important institutions providing public aid for innovations are: Polish Agency for Enterprise Development, the National Capital Fund, Bank Gospodarstwa Krajowego (National Economic Bank), and indirectly the State Treasury. Other two institutions: The National Center for Research and Development and National Science Center finance mostly basic and applied research – preparatory stage in the context of creation of innovative solutions. Each institution provides different public aid of different type ranging from grants to tax relief. Also the volumes of allocated resources differ among the institutions. Table 2 presents the significance of subventions that serve to implement the objectives of the Operational Programme Innovative Economy through which over €10 billion were assigned for the period 2007-2013.

The instruments of public aid for innovative projects are the most significant part of the innovation policy of the state. Support for innovativeness of the Polish economy is one of the main aims of the National Cohesion Strategy for 2007-2013. Currently the innovation policy aims mostly at implementing the strategy Europe 2020, which holds at its core the “Union of Innovation” initiative (*Komunikat Komisji Europa 2020...*, 2010, s. 14). The innovativeness of the economy depends thus on the success of innovative projects. However, at the level of particular projects there is a problem of insufficient capital supplies in the segment of innovative enterprises. It is thus desirable to combine public and private funds. For this reason it is believed that solution lies within government programmes and other institutions in the public sector for innovation development at the regional and local level (Pelka, 2007, s. 155-156). Additionally, European funds which finance Polish pro-innovation policy to a big extent are of catalytic significance.

4. Characteristics of the Operational Programme ‘Innovative Economy’ as one of the main sources of financing for innovative projects in Poland in the period of 2007-2013

The Operational Programme ‘Innovative Economy’ (OP IE) is one of the biggest sources of financing innovative projects in Poland during the period 2007-2013, and is the focus of empirical research for this article. It is one of the instruments of the National Strategic Reference Framework 2007-2013 (NSRF). The programme specifies the directions for support from financial resources of the European Union (EU) within the framework of the European Regional Development Fund (ERDF), European Social Fund (ESF) and Cohesion Fund (*Narodowe Strategiczne Ramy Odniesienia 2007-2013*, 2007).

The main goal of OP IE is the development of the Polish economy based on innovative enterprises. To reach this goal, a number of specific goals have been formulated (www.poig.gov.pl): an increase in innovativeness of enterprises, an increase in competitiveness of Polish science, an increase in the role of science in economic development, an increase in the share of innovative products of the Polish economy in international market, the creation of permanent and improved work places, an increase in information and communication technologies usage in the economy.

The OP IE aims at supporting innovative activities of both enterprises as well as scientific-research institutions. The OP IE provides financing for products, processes, marketing and organizational innovations which support the creation and development of innovative enterprises directly or indirectly.

Table 2. Selected forms of public aid granted for financing of innovative projects

Institution	Instrument	Activities	Target group	Allocation/amount of support
National Science Center	Grants within call-for-proposals Harmonia, Opus, Sonata, Preludium, Maestro, Sonata Bis and post-doctoral internships NSC (FUGA 1)	Financing of research projects, doctoral scholarships and post-doctoral internships.	Academic sector, R&D institutions, individuals, enterprises carrying out scientific research.	PLN 489.514.973.44 (period 2011) PLN 899.993.000 (period 2012) PLN 899.993.000 (planned for 2013 r.) Amount of financing differs depending on call for proposals, up to PLN 1.500.000.
The National Center for Research and Development	Grants within Applied Research Programme of the National Center for Research and Development Subventions within OP IE (Priority I and II) , Operational Programme Human Capital (OPHC) (Priority IV) and Operational Programme Infrastructure and Environment (OPI&E) (Priority XIII)	Basic, industrial, applied research and technical implementations, feasibility studies for developmental works.	Entities carrying out scientific research and development Works, PAN Sector of Science, R&D institutions and enterprises.	PLN 1.200.000 – within Applied Research Programme of the National Center for Research and Development (period 2012-2017), Project co-financing up to max PLN 5.000.000 € 4.100.000 within OP IE, OPI&E, OPHC
The Polish Agency for Enterprise Development (PARP)	Voucher for innovations	Purchase of service for implementing or development of product or technology.	SME sector	PLN 8.000.000 (period 2012); Up to max PLN 15.000
	Innovations loan	Purchase and implementation of the outcomes of R&D works, national or foreign licenses, infrastructure adjustment to new technologies.	SME sector	up to max PLN 2.000.000
Bank Gospodarstwa Krajowego	Technological credit for Priority IV, Action 4.3 OP IE	Granting investment credits with option of technological premium after implementation of the project (for partial credit repayment).	SME sector	€ 409.850.588 Up to max PLN 4.000.000
The National Capital Fund (BGK Group)	Subvention	Capital support for Venture Capital funds for the SME sector through decreasing the gap in accessibility to financing for innovators.	Venture Capital funds	Over €200.000.000 up to max PLN 50.000.000
State Treasury	Tax relief for new technologies	Deduction from tax base of the expenses related to the purchase of intangible assets of new technologies. Not older than 5 years on a world scale.	All entities	Deduction of up to 50% of the value of the expense for purchasing of new technologies.
The Polish Agency for Enterprise Development (PARP)	Subvention within OP IE	Development of Polish economy on the basis of innovative enterprises.	Enterprise sector, scientific research entities, central administration institutions, business support institutions and technical assistance.	PLN 10.186.030.644 (period 2007-2013) Up to max PLN 40.000.000.

The Programme consists of eight theme priorities that are comprised of the following (*Szczegółowy opis priorytetów...*, 2012):

- Priority I Research and development of modern technologies,
- Priority II R&D infrastructure,
- Priority III Capital for innovation,
- Priority IV Investments in innovative undertakings,
- Priority V Diffusion of innovation,
- Priority VI Polish Economy on the international market,
- Priority VII Information society – establishment of electronic administration,
- Priority VIII Information society – increasing innovation of the economy.

Additionally, there is Priority IX Technical assistance, which allows to finance all actions related to servicing of the Programme. Figure 1 presents the allocation percentages of the resources directed for each of the priorities within the OP IE from 2007 till 2013.

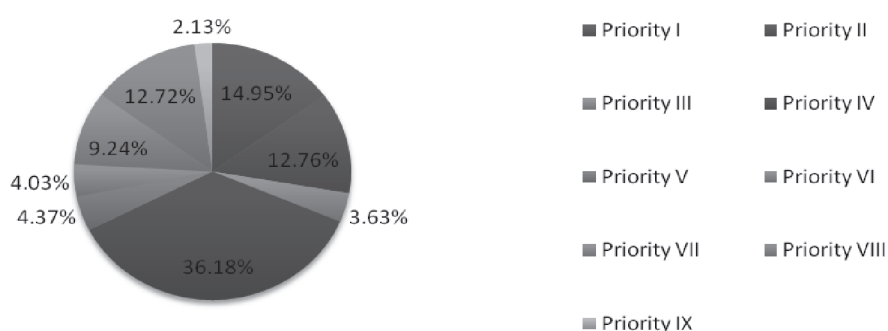


Figure 1. Structure of resource allocation within OP IE within years 2007-2013 (Source: compiled by the authors on the basis of <http://www.fundusze-strukturalne.gov.pl> (10.05.2013))

The OP IE targets four groups of beneficiaries – addressees of the public aid. The Figure 2 below presents the percentage structure.

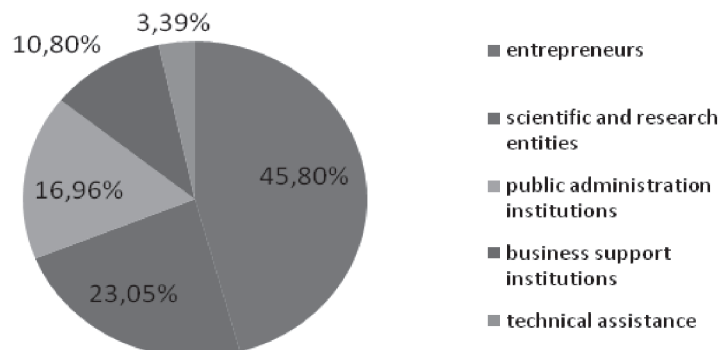


Figure 2. Structure of beneficiaries of public aid granted within the framework of OP IE in the years 2007-2013 (Source: compiled by the authors, based on <http://www.funduszezstrukturalne.gov.pl> (10.05.2013)).

The financial resources of the OP IE are granted to four categories of beneficiaries: entrepreneurs that comprise 45.8% of all the beneficiaries and are thus the most numerous group, scientific and research entities (23.05%), the central administration institutions (16.96%) and business support institutions (10.80%). The remaining financial resources are directed towards the servicing of OP IE.

The OP IE's budget comes from the country's own resources (15%) and from the EU (85%) that corresponds to the main rule of co-financing of the European funds. The total amount of financial resources available under the OP IE is €10,186,030,644, out of which € 8,658,126,047 come from the European Regional Development Fund, and €1,527,904,597 from the state's budget (*Szczegółowy opis priorytetów...* wyd. cyt.). Table 3 presents the allocation of the resources among each of the priorities within OP IE for 2007-2013 and the degree of implementation of the programme.

Table 3. Allocation of financial resources per each priority axis of the OP IE for 2007-2013 and the programme implementation degree (as on May 2013).

Priority	Allocation in €	Number of signed contracts	Projects as %	Value of signed contracts in PLN *	Co-financing amount as %	Public resources used as %	Resources transferred as %
Ogółem	10 186,030,644.00	12 281	100	36 277 234 976.84	100.00	86.26	42.95
I	1 522 633 778.00	1287	10.48	5 943 780 313.08	16.38	94.56	49.76
II	1 299 270 589.00	130	1.06	5 603 959 923.45	15.45	104.53	56.35

III	370 000 000.00	290	2.36	1 353 032 132.31	3.73	87.40	54.74
IV	3 685 284 334.00	1 632	13.29	12 729 774 702.62	35.09	83.76	41.62
V	444 880 000.00	276	2.25	1 533 328 151.46	4.23	83.46	43.36
VI	410 633 035.00	3886	31.64	1 337 441 615.05	3.69	78.68	36.58
VII	940 758 085.00	32	0.26	3 801 438 888.70	10.48	98.07	40.38
VIII	1 295 864 941.00	4541	36.98	3 291 381 006.84	9.07	61.52	25.99
IX	216 705 882.00	207	1.69	683 098 243.33	1.88	76.10	40.84

* Includes savings on terminated projects.

Source: compiled by the authors, based on www.poig.gov.pl (15.05.2013).

Summing up, there have been in total 12 281 contracts signed since the beginning of the implementation of OP IE until May 7th, 2013. This makes for 86.26% of the amount of co-financing of innovative undertakings. Priorities VIII and VI have the highest number of projects. The share of projects in relation to the total number of signed contracts within each priority is: for priority VIII – 36.98% and a bit less for priority VI – 31.64%. It is noteworthy to mention that the highest nominal amount granted for innovative projects was PLN 12 729 774 702.62 and was granted for implementation of priority IV which accounts for the highest share of co-financed projects in relation to the total amount of co-financing granted (35.09%). Table 3 presents also significant information regarding the degree of resources used per each of the priorities. The general percentage of financing used within the OP IE is 86.26%. Excess use of resources was noted for implementation of priority II and reached 104.53%.

The lowest percentage of used resources is noted for priority VIII and stands on 61.51% whereas in case of the other priorities the percentage oscillates around 90%. The level of resource assimilation within the implemented projects is 42.95%.

5. Indicators Analysis for selected priorities of the Operational Programme ‘Innovative Economy’

Projects co-financed by public funds should generate, by rule, other investments financed by private funds, generating thus the so called leverage effect. State intervention in the form of public aid should not take the form of an immediate advantage for the beneficiary receiving such assistance. Projects implemented with such assistance should be long-term, and should be subject to monitoring. By long-term it is assumed, among others, maintaining the project’s effects by implementing the indicators of result and product. These indicators

are used for monitoring the degree to which the project's objectives are being met and for assessing the project's effects at each stage of its implementation.

The product indicators measure the changes that occurred during implementation of the project and, in consequence, the expenditure of granted resources. These indicators should not be applied to periods extending beyond the agreed implementation dates. On the other hand, the result indicators measure the effects of actions taken after the completion of the project and as such have direct influence on the socio-economic environment.

For the purpose of this article the analysis of the indicators of product and result has been conducted for the projects co-financed within the OP IE for the years 2007-2012. An analysis was done concerning the following selected priority axes: research and development of modern technologies (Priority I), R&D infrastructure (Priority II), capital for innovations (Priority III), investments in innovative undertakings (Priority IV). Table 4 presents the product indicators for the above-mentioned priorities.

Table 4. Product indicators for five priority axes of OP IE (as for the first half a year of 2012)

Prior-ity	Indicator	Measure	Imple-mented	Total to be imple-mented	Degree of imple-mentation in %
I	Number of supported projects	Units	630	1620	38.89
III			252	200	126.00
IV			1023	1265	80.87
V			215	670	32.09
I	Number of new job places (EPC) related to R&D activities, being created in relation to project implementation	Units	103	3400	3.03
II	Number of supported projects for R&D infrastructure	Units	8	60	13.33
II	Number of new and modernized laboratories	Units	19	200	9.50
IV	Number of supported enterprises (included SME) that introduced innovations by themselves	Units	1002(793)	1200(530)	83.50
V	Number of institutions engaged in cooperative activities (distinguished between entrepreneurs (including SME) and business support institutions)	Units	81	600	13.50

Source: compiled by the authors, based on Załącznik nr 1, Sprawozdanie okresowe z realizacji Programu Operacyjnego Innowacyjna Gospodarka 2007-2013 za pierwsze półrocze 2012 r., Ministerstwo Rozwoju Regionalnego 2012.

Information gathered in Table 4 shows that the achieved level of product indicators is diversified among the five selected priority axes. Priorities III and IV are characterized by a high achievement level related to the product indicator (126% and 80.87% respectively). However, it should be taken into consideration that the value of the indicator for the projects supported up until now is determined by the amount of co-financing granted. That means, that in the case when a lower average project value was assumed, then the indicator may not be reached even until the end of implementation of the project.

The low indicators for priority axis II – R&D infrastructure as shown in this analysis are a bit disturbing. The percentage of implemented projects for R&D infrastructure that were supported is only 13.33%, and only 8 laboratories were modernized, out of the assumed total number of 60.

The limited number of projects co-financed within the priority axis V is mostly related to a small number of projects being implemented within the activities of this priority. This situation is likely to change before the end of 2015.

There are also significant disproportions as to the degree of implementation of the assumed implementation levels, as shown by the result indicators analysis in Table 5.

Table 5. Result indicators of five priority axes of OP IE (as for the first half a year of 2012)

Pri- ority	Indicator	Mea- sure	Imple- mented	Total to be imple- mented	Imple- mentation degree in %
I	Number of commercialised research results obtained in scientific institutions co-financed within OP IE	Units	27	420	6.43
I	Number of patent applications as result of projects implementation	Units	218	300	72.67
I	R&D expenditure of the entrepreneurs in relation to projects implementation (in millions PLN)	millions PLN	470.4	1770	26.58
II	Number of new job places (EPC) related to maintenance and servicing of R&D infrastructure that were created as project implementation result	Units	12	1000	1.2
II	Ratio of resources (including state's budget and OP IE) used for scientific equipment of environmental significance to the total amount of resources used for R&D equipment	%	b.d.	30	b.d.
II	Number of enterprises using services of the supported research and specialist laboratories (combined)	Units	9	1200	0.75
II	Number of accreditations that the supported research and specialist laboratories obtained	Units	0	50	0

II	Number of scientific institutions that make use of electronic databases and electronic magazines	Units	0	109	0
III	Number of newly created job places in the supported enterprises (in general and specific for male and female) [<i>Number of directly created new Job places(EPC)</i>]	Units	12	4500	0.27
IV			8660	42500	20.38
V			0	1350	0
III	Number of enterprises that use high risk capital and obtain capital from private investors (phases: seed, start-up, expansion – in general) in the framework of the granted support	Units	181	500	36.2
III	Number of supported newly opened enterprises (up to 2 years from their creation)	Units	4	355	1.13
III	Percentage of new SME supported within the priority axis and functioning 18 months after the support was granted	%	100	75	133.33
III	Number of investments in seed type enterprises	Units	0	18	0
III	Number of investments in start-up type enterprises	Units	0	37	0
III	Amount of mobilized private resources for financing of the innovative undertakings	mln €	105.21	140	75.15
IV	Number of enterprises (including SME) that started or developed their existing R&D activities as a result of granted support	Units	81 (55)	90 (60)	88.89 (91.67)
V	Number of newly created R&D job places in the enterprise sector (including SME) as a result of granted support	Units	336	1500	22.4
IV	Number of projects implemented in cooperation between scientific units and enterprises	Units	0	800	0
V			5	50	10
IV	Number of patents granted to enterprises (including SME) in the framework of implemented projects	Units	0	100(80)	0
IV	Number of SME that introduced organizational innovation within the framework of granted support	Units	243	240	101.25
IV	Number of enterprises (including SME) that obtained support for introduction of environmental Technologies or for development of eco-products	Units	34 (25)	157 (150)	21.66 (16.67)
V	Number of enterprises (including SME) that implemented innovation with assistance of business support institutions	Units	63 (61)	600	10.5 (10.17)
V	Number of patent applications of enterprises to EPO and USPTO as a result of granted support	Units	68	200	34
V	Number of enterprises (including SME) that used services provided by business support institutions	Units	5550	4000	138.75

Source: compiled by the authors, based on: *Załącznik nr 1, Sprawozdanie okresowe z realizacji Programu Operacyjnego Innowacyjna Gospodarka 2007-2013 za pierwsze półrocze 2012 r.*, Ministerstwo Rozwoju Regionalnego 2012.

The levels of indicators presented in Table 5. are very diversified, supposedly due to the fact that the projects are still being implemented. The high value of the indicator of patent applications for priority I is the effect of the implementation level of this priority that reached 72.67%. There is also a strict relation between some of the activities of priority I and IV that needs to be taken into account. These projects are implemented in two stages. In the first stage, a prototype is constructed and patent application is filed. In the second stage the results of R&D work from the first stage are implemented and the patent is obtained. For this reason, the indicator for priority IV requires special attention – the percentage of patents granted to enterprises. The value of this indicator equals to zero, which results from the fact that the average waiting period to obtain a patent in Poland is about 5 years. Most probably this indicator will reach its assumed levels only in 2015.

There are also high levels of result indicators for priority III – the percentage of new SEM that function 18 months after obtaining the grant reached 133.33%. The same goes for priority V – the number of enterprises (including SME), that obtained the support services from business support institutions reached 138.75%.

For priority II, the level of implemented result indicators is considerably low or even equals to zero. This is probably due to the fact that the contracted projects within priority II are in the process of implementation. These encompass infrastructural project with a very long time of completion.

From the data obtained from the Ministry of Regional Development one can conclude that the indicators for priority III, such as the number of investments in seed and start-up enterprises, are equal to zero. However, according to the representatives of seed and start-up funds that were interviewed, during the first quarter of 2012 investments were done as for start-up and seed enterprises. For this reason it may be concluded that the data in Table 5 missed such information because it was not provided for the reporting institution.

When analyzing the data for the period 2007-2012 one cannot expect that the levels of implementation would have reached the assumed levels of implementation. The full assessment of implementation indicators will be possible only upon completion of the period 2007-2013 and after finalizing all projects implementation of this period until 2015.

6. Conclusions

Public aid for innovation financing has acquired various forms, which actually are diversifications of two groups. The first group – active – is direct

financing, such as subventions. The second group – passive – is a reduction in obligations to the state's budget.

This paper has focused on innovation financing from the OP IE, which is one of the instruments of state's structural policy in the period of 2007-2013. The total amount of €10 186 030 644.00 was allocated to meet the goals of the programme. The effects of implemented projects that are co-financed from the European Union resources have been measured by product and result indicators, that enable the establishing of the degree of implementation and durability of the projects.

The conducted analysis verified positively the main hypothesis and allowed for formulation of the following concluding remarks. The OP IE has been the main innovation financing source in Poland in the period of 2007-2013. The expected results of the programme in the form of assumed values of product and result indicators are not ready for assessment yet, despite the level of contracted resources of 86.26% in relation to the total allocated funds. The assessment of the actual degree of implementation of the project measured by the assumed level of product and result indicators will be possible after completion of the programme financing perspective and upon completion of the projects budget settlement that incorporates the rule of n+2.

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