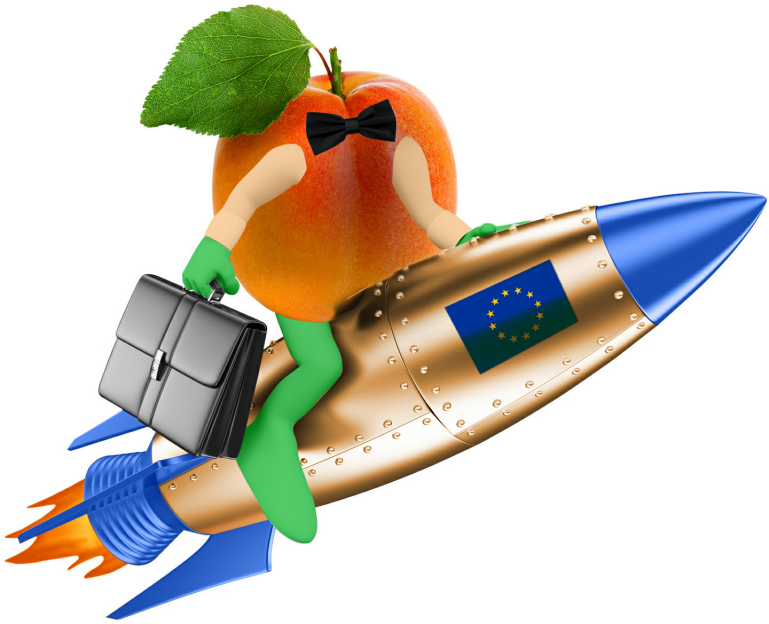

SELECTED ASPECTS OF THE INNOVATION POLICY OF ENTERPRISES OPERATING IN THE MEMBER STATES OF THE EUROPEAN UNION

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Summary

In the era of innovation revolution it is reasonable to conduct a rational innovation policy at the national, regional and enterprise level. Innovations have become an essential factor of the development of enterprises, increasing their competitiveness, improving their market position, increasing their economic efficiency etc. Assumptions of this policy should be based on a precise diagnosis of the existing situation in the field of innovation activity.

In this article the attempt of this diagnosis was taken by seeking answers on the following questions:

1) Did companies operating in the Member States of the European Union conduct rational policy in range of innovation activity?
2) Did implemented innovations contribute to obtain the specified turnover?
3) What part of the obtained turnover did enterprises invest in innovation activities?

To answer on these questions the method of statistical-comparative analysis of empirical researches was used. These researches were conducted by TNS Political & Social in the 28 Member States of the European Union, Switzerland and the United States in February 2016 on a group 14117 enterprises on EU business innovation terms.

Keywords: innovation, innovation policy, enterprise, development, management

Introduction

Social-economic development of the global economy was accompanied by three epochal changes which brought a lasting transformation of the way people work and live. We are talking about three revolutions: agricultural revolution, industrial revolution and information revolution. Now the world is at the beginning of the fourth revolution, that is, the innovation revolution which is caused by the following mega trends: globalization, technological development, changing demographics and structure of the industry, global presence of emerging economies, global warming and increasing pollution of the environment. Global problems are emerging within these megatrends. The problems have to be solved by governments, organizations and people (Lee, Olson and Trimi, 2012, p. 819–820). Against the background of these revolutions the development of the economies of particular countries took place and is taking place according to the following scenarios:

1) development focused on traditional sectors with the domination of capital as a production factor,
2) development focused on the sectors of modern technologies, which originate from knowledge and innovations.

In the second scenario the dominant role is played by investments in the spheres of: science, knowledge, research and development, quality of management, innovation culture, innovations.[1]

It is necessary to emphasize here that only few countries developed according to the second scenario. The most prominent among them are the United States, Japan, as well as South Korea, Taiwan, Thailand (Baruk, 1997, p. 11–105). These countries, as leaders of technological progress created and create global leadership in the management of knowledge and technological development. The remaining countries, including those forming the European Union, are striving to, within the boundaries of their financial and intellectual capacity, follow the path set out by the leaders[2]. This is not an easy road, despite the awareness that the lack of innovations and industrial applications constitutes one of the main reasons for slow growth of the European economy (Krusinskas, Norvaisiene, Lakstutiene i Vaitkevicius, 2015, p. 122).

The experiences of the leaders of technological progress show that innovations constitute the basis of lasting economic growth of every country, particular economic entities, enable the improvement of economic and social conditions (Wu, 2017, p. 1330). Thus, it is justified to cover them with a rational innovation policy on the level of country, regions, economic entities[3]. Especially that innovations constitute the lifeblood of a company — on the one hand, and on the other hand — the process of creating innovations is one the hardest and most unreliable processes for management. This is shown by high failure rates ranging from 6 out of 10 to 9 out of 10 (Harkema, 2003, p. 340). It is thought that about 44% of innovative projects don't allow achieving the planned profits, that the concept of one product out of seven becomes a new, successful product and a half of all products enter the market too late (Tepic, Kemp and Omta, 2013, p. 518).

Innovation policy is understood here as a collection of diverse forms of activity associated with management, organization, finances, information, technical and legal aspects, aimed at forming conditions favourable for innovative activity, enabling the acquisition and utilization of material, financial and intellectual resources optimum for a particular economic entity, for the purpose of achieving goals in the area of innovative activity in a rational way. The basic component action of such policy is defining the goals of development of innovative activity and the resources and methods for their implementation.

Generally, the innovation policy should be aimed at creating a culture of knowledge, culture of innovation, an environment of experiences friendly for innovative activity, able to satisfy the needs of an individual client, using the resources of various organizations dispersed around the whole world (Prahalad and Krishnan, 2010, p. 26–33). Forming such policy is determined by the openness of managers to changes, thinking about the future, rather than the past of a company, awareness and the utilization of modern methods of management, including innovation management and management through innovations, openness to the individual needs of clients, the ability to identify even weak signals about changes taking place in the external environment, ability to understand the internal obstacles in innovative activity and the ability to overcome these obstacles, recognizing creative abilities in employees and clients, which should be revealed and efficiently used in the processes of creation and implementation of

innovations leading to achieving a competitive advantage on the market (Wallace, Butts, Johnson, Stevens and Smith, 2016, p. 982).

Working out a rational innovation policy supports dynamic development of innovative activity, which leads to innovations improving the economic, technical and social conditions of the functioning of companies, raising their competitiveness, delivering the expected values to employees, company, its stakeholders and individual clients (Ferraresi, Quandt, dos Santos and Frega, 2012, p. 690).

The goal of this article is an attempt to answer the general question: Do company managements pursue any innovation policy, especially policy supporting the process of building innovative dynamics, eliminating all barriers in this respect, systemic utilization of the creativity of employees and clients in the processes of creation and implementation of innovations?; as well as to the particular questions:

1) Did the implemented innovations contribute to achieving defined revenues?
2) What share of generated revenues was invested by companies in innovative activity?

The attempt to answer the above questions was made on the basis of a statistical-comparative analysis of the results of empirical research conducted by TNS Political & Social in 28 Member States of the European Union, Switzerland and USA in February 2016 on a group of 14117 companies in the area of trends in business innovations in the EU (Innobarometer, 2016, p. 2). For work on the publication also the method of critical-cognitive analysis of literature was used.

The share of revenues generated from innovations implemented in the years 2011–2013

Undoubtedly, innovations have a significant impact on the economics of every company under the condition that they constitute an important instrument of development policy pursued by the managements of these organizations. What may be a measure of such policy is the share of revenues generated from innovative products, or services introduced to production and

the market. As table 1 shows, in 2013 on average in the European Union every tenth company didn't generate any revenues from innovations implemented after January 2011. The biggest percentage of the surveyed companies declared that innovations generated from 1% to 25% of their revenues. In 13% of companies the share of revenues generated thanks to the implemented innovations ranged from 26% to 50%. A small percentage of the surveyed companies generated even higher revenues. In three out of a hundred companies the share of revenues generated from innovations ranged from 51% to 75%. At the same time in four out of a hundred companies the share of revenues from innovations ranged from 76% to 100%.

In the group of EU Member States the popularity of particular shares of revenues generated from implemented innovations was diversified. The worst situation was observed in Croatian (25%), Dutch (19%), Cypriot and Latvian (18% each) companies, where the share of revenues generated from implemented innovations was zero. At the other end of the spectrum were: Spanish (5%), German (6%), Danish, Finnish and Irish (7% each) companies. The biggest difference in the popularity of zero share from the implemented innovations, amounting to 20 percentage points, was observed between Croatia and Spain.

In Poland 8% of companies generated no revenues from implemented innovations. This result is 2 percentage points lower, compared to the average of the European Union. It puts Poland on the 20th place among Member States, along with Austria, Luxembourg and Romania.

A much greater percentage of the surveyed companies generated from 1% to 25% of their revenues from the implemented innovations. In this respect the leaders were:

1) Spain (75% of the surveyed), Ireland (70%) and Belgium (67%) — among old Member States,
2) Malta (71%), Bulgaria (66%) and Croatia, Romania, Slovenia and Hungary (65% each) — among new Member States.

At the other end of the spectrum were:

1) Sweden (52%), Denmark and Holland (53% each) — among old Member States,
2) Cyprus (44%), Latvia (53%) and Poland (56%) — among new Member States.

Table 1. The percentage of companies whose revenues in 2013 were the result of innovations introduced after January 2011

Specification	The percentage of shares generated from the implemented innovations					
	0%	From 1 to 25%	From 26 to 50%	From 51 to 75%	From 76 to 100%	I don't know/No answer
	In % of companies which implemented innovative goods, or services after January 2011					
European Union UE-28	**10**	**61**	**13**	**3**	**4**	**9**
Old Member States UE-15:						
Austria	8	65	12	2	7	16
Belgium	15	67	7	2	2	7
Denmark	7	53	15	7	6	12
Finland	7	54	17	5	14	3
France	14	63	6	1	4	12
Greece	11	64	10	9	2	4
Spain	5	75	9	4	0	7
Holland	19	53	12	3	4	9
Ireland	7	70	14	2	0	7
Luxembourg	8	65	12	2	7	6
Germany	6	58	16	3	7	10
Portugal	11	66	11	3	3	6
Sweden	13	52	16	4	6	9
Great Britain	14	55	14	4	6	7
Italy	10	59	13	3	4	11
New Member States UE-13						
Bulgaria	12	66	12	0	2	8
Croatia	25	65	4	2	2	2
Cyprus	18	44	12	7	8	16
Czech Republic	10	61	17	2	3	7
Estonia	17	57	10	2	5	9
Lithuania	10	64	11	2	6	7
Latvia	18	53	14	6	4	5
Malta	11	71	5	3	4	6
Poland	**8**	**56**	**17**	**7**	**4**	**8**
Romania	8	65	13	2	2	10
Sovakia	14	61	15	3	2	5
Slovenia	17	65	12	0	1	5
Hungary	16	65	13	0	3	3
United States	10	60	16	4	6	4

Source: Prepared on the basis of: (The role, 2014, p. T13).

The maximum difference in the popularity of this phenomenon amounting to 31 percentage points was observed between Spain and Cyprus. In Poland there were 56% such companies, which is 5 percentage points less than the EU average. This result puts Poland on the 21st position among Member States.

A much smaller percentage of the surveyed companies generated 26% to 50% of revenues from the implemented innovations. Most often they were: Finnish, Czech and Polish companies (17% each) and the least often they were Croatian (4%), Maltese (5%) and French (6%) companies. The maximum difference in popularity of the occurrence of such shares was observed between Finland, Poland and Croatia and amounted to 13 percentage points. The share of Polish companies positioned in the discussed percentage range was 4 percentage points higher than the EU average. It gave Poland (along with Czech Republic and Finland) the first place among Member States.

A small percentage of companies generated from the implemented innovations between 51% and 75% of total revenues. This result was most often achieved by Greek (9%), Danish, Cypriot and Polish (7% each) companies. At the other end of the spectrum there were Bulgarian, Slovenian and Hungarian companies, as none of them achieved a share from this range. The maximum difference in the popularity of this phenomenon amounting to 9 percentage points was observed between Greece and Bulgaria, Slovenia, Hungary. In Poland there were 7% of such companies, that is, 4 percentage points more than on average in the EU. This gave Poland the second place among Member States along with Denmark and Cyprus.

A small percentage of companies generated from 76% to 100% of revenues from implemented innovations. In this respect Finnish (14%) and Cypriot (8%) companies were the leaders. At the same time there were no companies in Spain and Ireland which generated that much revenues from innovations. The biggest difference in the popularity of occurrence of this phenomenon amounting to 14 percentage points was observed between Finland and Spain, Ireland. In Poland there were 4% such companies, which is the same as the EU average. This puts Poland on the 11th position among Member States along with France, Holland, Italy, Latvia and Malta.

The share of revenues generated from innovations implemented in the years 2013–2015

The surveys covering the years 2013–2015 showed that the popularity of generating particular revenues from implemented innovations was variable. As table 2 shows, on average in the European Union every tenth company didn't generate in 2015 any revenues from innovations implemented after January 2013. Slightly more than every fifth company generated 1%–5% and 11%–25% of revenues from innovations. One out of five companies generated 6%–10% of revenues from innovations. One out of ten companies generated 26% to 50% of its revenues from the applied innovations. In seven out of a hundred companies revenues generated from innovations constituted at least 51% of total revenues.

Among EU Member States the popularity of generating particular ranges of revenues was diversified. Generating no revenues from innovations was most common among: Estonian (15%), Slovenian (14%) and Italian (13%) companies. At the other end of the spectrum were: Maltese (4%), Austrian and Spanish companies (7% each). The biggest difference in the popularity of occurrence of this phenomenon was observed between Estonia and Malta and amounted to 11 percentage points. In Poland 9% of companies generated no revenues from implemented innovations, this is 1 percentage point less than on average in the European Union, which is a positive phenomenon. The percentage of such companies puts Poland on the 15th position among Member States along with France, Germany, Great Britain, Cyprus, Czech Republic and Lithuania.

The surveyed companies more often generated from 1% to 5% of revenues from innovations. In this respect Spanish and Latvian companies (31% each) were the leaders. Meanwhile, at the other end of the spectrum there were Cypriot (12%), German and British (14% each) companies. The maximum difference in the popularity of occurrence of this phenomenon amounting to 17 percentage points was observed between Spain, Latvia and Germany, Great Britain. In Poland every fifth company generated 1% to 5% of revenues from the implemented innovations. The result is 1 percentage point lower than the average for the EU, putting Poland on the 12th position among Member States, along with Belgium, Holland and Malta.

Table. 2. The percentage of companies, whose revenues in 2015 were the effect of innovations introduced after January 2013

Specifications	The share of revenues from implemented innovations in total revenues, in percent						
	0%	From 1 to 5%	From 6 to 10%	From 11 to 25%	From 26 to 50%	51% or more	Don't know
	In % of companies which from January 2013 implemented at least one innovation						
European Union UE-28	**10**	**21**	**20**	**21**	**10**	**7**	**11**
Old Member States UE-15:							
Austria	7	22	16	20	10	9	16
Belgium	8	20	22	22	11	5	12
Denmark	11	15	19	18	15	11	11
Finland	8	23	13	24	9	16	7
France	9	27	21	22	10	5	6
Greece	11	18	24	22	11	11	3
Spain	7	31	18	23	7	5	9
Holland	11	20	21	24	3	11	10
Ireland	11	18	27	25	8	7	4
Luxembourg	8	16	18	28	11	10	9
Germany	9	14	23	27	10	9	8
Portugal	12	18	21	19	9	4	17
Sweden	10	18	21	17	15	11	8
Great Britain	9	14	21	20	12	10	14
Italy	13	22	17	21	4	4	19
New Member States UE-13							
Bulgaria	8	24	21	20	9	8	10
Cyprus	10	26	25	23	5	5	6
Cypr	9	12	18	25	8	21	7
Czech Republic	9	17	21	20	19	8	6
Estonia	15	26	15	15	5	7	17
Lithuania	9	18	18	13	22	11	9
Latvia	10	31	19	17	8	8	7
Malta	4	20	23	15	14	7	17
Poland	**9**	**20**	**25**	**18**	**13**	**7**	**8**
Romania	10	22	22	21	14	6	5
Slovakia	10	18	13	23	12	14	10
Slovenia	14	26	19	18	10	4	9
Hungary	12	18	27	24	10	7	2
United States	14	19	25	17	4	16	5

Prepared on the basis of: (Innobarometer 2016, 2016, p. T10, T11)

The leaders in the range from 6% to 10% were Irish and Hungarian companies (27% each), as opposed to Finnish and Slovakian companies (13% each). The biggest difference in the popularity of this phenomenon, amounting to 14 percentage points, was observed between Ireland, Hungary and Finland, Slovakia. In Poland every fifth company achieved a share of revenues from implemented innovations fitting in this range. This result is 5 percentage points higher than the average for the European Union and puts Poland on the third place mong Member States, along with Croatia.

A significant percentage of companies achieved 11% to 25% of revenues from the implemented innovations. This result was recorded most often in Luxembourgian (28%), German (27%), Irish and Cypriot (25% each) companies. This result was the least common among Lithuanian (13%), Estonian and Maltese (15% each) companies. The biggest difference in the frequency of occurrence of this phenomenon was observed between Luxembourg and Lithuania and amounted to 14 percentage points. In Poland 18% of companies generated 11% to 25% of revenues from implemented innovations, which was 3 percentage points below the EU average. This result gave Poland only the 21st place among Member States, along with Denmark and Slovenia.

Among the surveyed companies there were also such companies which generated 26% to 50% of revenues from the implemented innovations. In this respect Lithuanian (22%) and Czech (19%) companies were the leaders. At the other end of the spectrum there were Dutch (3%) and Italian (4%) companies. The maximum difference in the frequency of occurrence of this phenomenon, amounting to 19 percentage points was observed between Lithuania and Holland. In Poland 13% of companies which implemented innovations generated 26%–50% of their revenues thanks to them. This result is higher than the EU average by 3 percentage points and puts Poland on the 7th position among Member States.

It is necessary to emphasize here that some companies implementing innovations generated the highest shares of revenues from innovations amounting to 51% and more. In this respect Cypriot (21%) and Finnish companies (16%) were the leaders, as opposed to Portuguese, Italian and Slovenian (4% each) companies. The biggest difference in the popularity of occurrence of this phenomenon, amounting to 17 percentage points was

observed between Cyprus and Portugal, Italy and Slovenia. In Poland seven out of a hundred companies achieved this level. This result is equal to the EU average, giving Poland 16th position among Member States, along with Ireland, Estonia, Malta and Hungary.

To compare the dynamics of changes in the frequency of occurrence of the percentage of companies generating particular shares of revenues from implemented innovations, particular ranges of revenue shares were brought down to a state of comparability. It turns out that on average in 2015 every tenth company in the EU had no revenues from implemented innovations, similarly as in 2013. In USA the share of such companies was 4 percentage points higher and in 2013 it was the same as in the EU.

Among EU Member States the growth of the percentage of companies not generating any revenues from applied innovations, which is a negative phenomenon, was observed in:

1) Denmark and Ireland (by 4 percentage points), Finland and Portugal (by 1 percentage point), Spain (by 2 percentage points), Germany and Italy (by 3 percentage points) — among old Member States,
2) Poland (by 1 percentage point), Romania (by 2 percentage points) — among new Member States.

At the same time the highest drops of the percentage of companies not generating any revenues from the applied innovations in 2015, compared to 2013 (positive phenomenon) was observed in: Croatian (by 15 percentage points), Cypriot (by 9 percentage points), Latvian and Dutch (by 8 percentage points each) companies.

In comparison to 2013, in 2015 the popularity of generating 1% to 25% of revenues from innovations increased on average in the European Union by 1 percentage point, similarly as in the USA. At the same time, looking at particular countries, growth in this range was recorded by: Finnish (by 6 percentage points), French (by 7 percentage points), Dutch (by 12 percentage points), German (by 6 percentage points), Swedish (by 4 percentage points), Italy (by 1 percentage point), Croatian (by 9 percentage points), Cypriot (by 11 percentage points), Latvian (by 14 percentage points), Polish (by 7 percentage points) and Hungarian companies (by 4 percentage points). The biggest drops of the percentage

of companies generating 1% to 25% of revenues from innovations were recorded in Lithuania (by 15 percentage points), on Malta (by 13 percentage points), in Portugal (by 8 percentage points), in Austria and Slovakia (by 7 percentage points each).

In comparable periods the percentage of companies generating 26% to 50% of revenues from innovations decreased on average in the EU by 3 percentage points. In the USA this drop amounted to 12 percentage points. At the same time a beneficial phenomenon in form of growth of the percentage of companies was recorded by the following countries: Belgium (by 4 percentage points), France (by 4 percentage points), Greece (by 1 percentage point), Croatia (by 1 percentage point), Czech Republic (by 2 percentage points), Lithuania (by 11 percentage points), Malta (by 9 percentage points) and Romania (by 1 percentage point). At the same time the highest drops of this percentage were recorded in: Holland and Italy (by 9 percentage points each), in Finland (by 8 percentage points), in Ireland, Germany and Latvia (by 6 percentage points each).

A small percentage of the surveyed companies generated 51% or more of their revenues from implemented innovations. In 2015 on average in the EU there were 7% such companies, similarly as in 2013. In USA the percentage was 16% in 2015 and 10% in 2013. Among Member States the frequency of this phenomenon varied. In 15 countries a growth of the percentage of companies generating at least 51% of revenues from innovations was observed, which is a positive trend. Here, the biggest growth was recorded in case of companies functioning in: Slovakia (by 9 percentage points), in Bulgaria, Cyprus (by 6 percentage points each) and in Ireland (by 5 percentage points). In 7 Member States the percentage of companies generating at least 51% of revenues from innovations decreased in comparable periods. This particularly concerns: Poland (by 4 percentage points), Finland and Italy (by 3 percentage points each), Denmark, Portugal and Latvia (by 2 percentage points each).

In Poland the percentage of companies not generating any revenues from implemented innovations increased by 1 percentage point in comparable periods. The share of companies which generated 1% to 25% of revenues from innovations increased by 7 percentage points, while the

share of companies generating from 26% to 50% of revenues from innovations dropped by 4 percentage points. Also, the percentage of companies generating at least 51% of revenues from innovations dropped by 4 percentage points.

The volume of revenues invested in innovative activity

The second measure of innovative policy of the managements of the surveyed companies, analysed in this publication, is the percentage of revenues generated in 2015, invested in innovative activity. As table 3 shows, on average in the EU almost every fourth company invested no revenues in innovative activity. In the USA the share of such companies was 3 percentage points higher. Almost every fifth company allocated less than 1% revenues to this purpose. In the USA the share of companies which decided to invest their revenues this way was 5 percentage points lower. 36% of companies which after January 2013 introduced at least one innovation, allocated 1% to 5% of revenues to innovative activity. In the USA it was 28%. Every tenth company spent 6% to 10% of revenues on innovative activity. In the USA it was 13%. Seven out of a hundred companies allocated at least 11% of revenues to this purpose, while in the USA it was 10%.

Looking at EU Member States in general, the popularity of financing innovative activity with the generated revenues was diversified. Among countries that invested no revenues the leaders were: France (33%), Greece, Ireland and Sweden (27% each) — in the group of old Member States and Romania (36%), Latvia and Poland (28% each) and Slovenia (27%) — in the group of new Member States. The smallest percentage of such companies was found in: Austria (10%), Finland and Germany (15% each) — among old Member States and on Malta (14%), in Czech Republic and Hungary (15%each) — among new Member States. The biggest difference in the popularity of this phenomenon amounting to 26 percentage points was found between Romania and Austria. In Poland the share of such companies amounted to 28%, which is 4 percentage points above the EU average. This gave Poland the third, rather disgraceful place among Member States, along with Latvia.

Table 3. Percentage of companies, which in 2015 invested a share of their revenues in innovative activity

Specification	Ranges of percentages of invested revenues					
	0%	Less than 1%	From 1% to 5%	From 6% to 10%	11% or more	I don't know/No answer
	W % przedsiębiorstw, które od stycznia 2013 r. wprowadziły przynajmniej jedną innowację					
European Union UE-28	**24**	**19**	**36**	**10**	**7**	**4**
Old Member States UE-15:						
Austria	10	23	39	13	9	6
Belgium	17	14	44	12	10	3
Denmark	19	28	31	9	9	4
Finland	15	29	39	8	9	0
France	33	21	31	7	6	2
Greece	27	16	38	9	9	1
Spain	26	25	33	11	2	3
Holland	21	17	40	10	8	4
Ireland	27	17	34	11	8	3
Luxembourg	18	20	34	10	11	7
Germany	15	24	37	10	7	7
Portugal	24	22	37	7	7	3
Sweden	27	14	34	9	12	4
Great Britain	25	23	34	5	6	7
Italy	23	12	43	10	7	5
New Member States UE-13:						
Bulgaria	26	18	31	8	13	4
Croatia	16	33	34	9	6	2
Cyprus	25	19	35	6	10	5
Czech Republic	15	19	42	13	10	1
Estonia	18	22	37	12	4	7
Lithuania	22	18	32	11	11	6
Latvia	28	19	34	8	8	3
Malta	14	9	52	9	9	7
Poland	**28**	**17**	**33**	**15**	**4**	**3**
Romania	36	22	27	7	6	2
Slovakia	17	14	40	13	14	2
Slovenia	27	25	27	12	5	4
Hungary	15	21	47	11	4	2
USA			27	14 28	13 10	8

Source: Prepared on the basis of: (Innobarometer 2016, 2016, p. T54).

The biggest percentage of companies which invested less than 1% of revenues in innovative activity was found in: Finland (29%), Denmark (28%) and Spain (25%) — among old Member States and in Croatia (33%), Slovenia (25%), Estonia and Romania (22% each) — among New Member States. At the other end of the spectrum there were: Italian (12%), Belgian and Swedish (14% each) companies — in the group of old Member States and Maltese (9%), Slovakian (14%) and Polish (17%) companies — in the group of new Member States. The maximum difference in the frequency of occurrence of this phenomenon appeared between Croatia and Malta and amounted to 24 percentage points. In Poland only 17% of companies invested less than 1% of revenues in innovative activity. This result was 2 percentage points lower than the EU average and put Poland on the 20th position among Member States, together with Holland and Ireland.

In all Member States the highest percentage of companies which from January 2013 introduced at least one innovation allocated 1% to 5% of revenues to innovations in 2015. In this respect the leaders were: Belgian (44%), Italian (43%) and Dutch (40%) companies — among old Member States and Maltese (52%), Hungarian (47%) and Czech (42%) companies — among new Member States. The smallest shares of such companies were found in: Denmark and France (31% each) — among old Member States and Romania and Slovenia (27% each) — among new Member States. The biggest difference in the popularity of occurrence of this phenomenon, amounting to 25 percentage points appeared between Malta and Romania, Slovenia. In Poland every third company invested in innovative activity from 1% to 5% of their revenues. This result is 3 percentage points lower than the average for the EU, placing Poland on the 21st position among Member States, along with Spain.

A much smaller percentage of companies allocated 6% to 10% of their revenues to innovative activity. Most often they were companies from: Austria (13%), Belgium (12%) and Spain (11%) — among old Member States and companies from Poland (15%), Czech Republic and Slovakia (12% each) — among new Member States. The least often they were: British (5%), French and Portuguese companies (7% each) — among old Member States and Cypriot (6%) and Romanian (7%) companies — among new Member States. The maximum difference in the popularity of occurrence of this phenomenon,

amounting to 10 percentage points, appeared between Poland and Great Britain. In this group of invested share of revenues the percentage of Polish companies was 5 percentage points higher than the EU average, putting Poland on the first position among Member States.

A small percentage of companies allocated to innovative activity at least 11% of revenues. In this respect: Swedish (12%) and Luxembourgian (11%) companies were the leaders — among old Member States and Slovakian (14%) and Bulgarian (13%) companies were the leaders — among New Member States.

Dynamics of investing in innovative activity

Comparing the results of surveys conducted in 2016 with the results obtained in 2015 makes it possible to capture the dynamics of the investigated phenomenon. The data contained in table 4 and table 3 suggest that in 2015, on average in the EU the share of companies which invested no revenues in innovative activity increased by 2 percentage points, which is a negative phenomenon. Also, the share of companies spending less than 1% of their revenues on innovative companies increased by 1 percentage point. At the same time the share of companies which allocated at least 11% of revenues to innovative activity in 2015 decreased by 1 percentage point, compared to 2014. For the revenue share ranges of: 1% to 5% and 6% to 10%, the percentage of companies financing innovative activity from their revenues stayed in the compared years on the same level, 36% and 10%, respectively.

Among particular Member States diversified popularity of investing in innovative activity a particular percentage of revenues was observed. In comparison to 2014, in 2015 the percentage of companies which invested no revenues in innovative activity increased in 14 Member States. This concerns mainly Ireland and Great Britain (growth of 6 percentage points in each case), Belgium and Denmark (5 percentage points) — among old Member States, as well as Poland and Romania (8 percentage points each) and Slovakia (6 percentage points) — among new Member States. The biggest drops of the percentage of such companies were found in: Portugal (by 9 percentage points) and Spain (by 3 percentage points) — among old Member States and Malta (by 8 percentage points), Cyprus and Hungary (5 percentage points each) — among new Member States.

Table 4. Percentage of companies which in 2014 invested a share of their revenues in innovative activity

Specification	Ranges of percentage of revenues invested in innovation					
	0%	Less than 1%	From 1% to 5%	From 6% to 10%	11% or more	I don't know/no answer
	In % of companies which from January 2012 introduced at least one innovation					
European UnionUE-28	**22**	**18**	**36**	**10**	**8**	**6**
Old Member States UE-15:						
Austria	13	19	40	10	8	10
Belgium	12	18	48	10	6	6
Denmark	14	21	34	10	10	11
Finland	16	27	37	5	13	2
France	33	13	38	7	7	2
Greece	26	15	35	11	10	3
Spain	29	16	40	8	4	3
Holland	20	15	35	15	14	1
Ireland	21	22	33	9	12	3
Luxembourg	20	19	38	9	12	2
Germany	15	20	40	10	9	6
Portugal	33	12	33	11	4	7
Sweden	28	16	29	12	13	2
Great Britain	19	22	33	6	11	9
Italy	20	18	35	14	6	7
New Member States UE-13:						
Bulgaria	22	16	41	10	6	5
Croatia	16	25	36	8	11	4
Cyprus	30	12	39	5	10	4
Czech Republic	14	22	37	12	11	4
Estonia	21	27	29	8	9	6
Lithuania	19	26	35	6	11	3
Latvia	29	19	29	9	10	4
Malta	21	16	42	15	3	3
Poland	**20**	**19**	**33**	**9**	**15**	**4**
Romania	28	21	29	9	10	3
Slovakia	11	14	35	14	21	5
Slovenia	23	22	34	11	8	2
Hungary	20	21	39	13	4	3
USA	33	13	31	6	12	5

Source: prepared on the basis of: (Innobarometer 2015, 2015, p. T66).

In 2015 the percentage of companies investing less than 1% of their revenues in innovative activity increased in 16 Member States of the European Union. The biggest gains were recorded in Portugal (by 10 percentage points), Spain (by 9 percentage points) and France (by 8 percentage points) — among old Member States and in Croatia (by 8 percentage points) and on Cyprus (by 7 percentage points) — among new Member States. In 9 Member States the percentage of companies investing less than 1% of revenues in innovative activity decreased. This trend concerned mainly Italy (drop by 6 percentage points) and Ireland (by 5 percentage points) — among old Member States and Lithuania (drop by 8 percentage points) and Malta (by 7 percentage points) — among new Member States. In three countries the percentage of companies investing less than 1% of revenues in innovative activity stayed at the same level in the discussed periods.

In 13 Member States investments in the range of 1% to 5% of revenues decreased in the analysed years. This particularly concerns France, Spain (drop by 7 percentage points), Bulgaria (by 10 percentage points) and Slovenia (by 7 percentage points). At the same time in 14 countries growth of the percentage of companies investing 1% to 5% of revenues was observed. This particularly concerns Malta (growth of 10 percentage points), Italy, Estonia and Hungary (by 8 percentage points).

In comparison to 2014, in 2015 investments in innovative activity amounting to 6% to 10% of revenues, increased in 13 Member States. In this respect the leaders were Poland (growth by 6 percentage points) and Lithuania (by 5 percentage points). A drop of the percentage of companies was observed in 14 countries. The biggest drop was observed on Malta (down 6 percentage points) and in Holland (by 5 percentage points).

Finally, growth of the percentage of companies allocating at least 11% of its revenues to innovative activity was found in only 6 countries. This concerns mainly Bulgaria (growth by 7 percentage points), Malta (by 6 percentage points) and Belgium (by 4 percentage points). In 18 countries the percentage of companies investing at least 11% of revenues in innovative activity decreased. The biggest drops were observed in Poland (drop of 11 percentage points), Slovakia (7 percentage points) and Holland (by 6 percentage points).

Conclusion

Statistical-comparative analysis of the empirical material suggests that the managements of companies functioning in Member States of the EU pursued innovation policy, but the results of this policy are not satisfactory, as on average every tenth company didn't generate any revenues from the innovations it implemented. Most of such companies were operating in Estonia and Slovenia — in the years 2013–2015 and in Croatia and Holland — in the years 2011–2013. In 2013 61% of companies generated 1% to 25 % of revenues from the implemented innovations. In 2015 the percentage increased by just 1 percentage point.

Among Member States the popularity of generating a particular share of revenues from the applied innovations was diversified — both upwards and downwards in the discussed periods. For example, in 2013 75% of Spanish companies generated 1% to 25% of revenues from innovations implemented from January 2011. In 2015 this percentage decreased by 3 percentage points. In 2013 on Malta there were 71% such companies, but in 2015 there were only 58%. An example of positive changes is Croatia, where the percentage of companies generating revenues in the 1% — 25% range in the discussed periods increased by 9 percentage points.

What also serves as evidence of insufficient efficiency of innovation policies is the diversified percentage of companies generating 26% to 50% of revenues from the implemented innovations. In this respect in 2013 the leaders were Finland, Czech Republic and Poland, but in 2015 this percentage dropped by 8 percentage points in case of Finland, increased by 2 percentage points in case of Czech Republic and dropped by 4 percentage points in case of Poland. In Finland almost every fifth company in 2013 generated at least 51% of revenues from implemented innovations. However, in 2015 the percentage was 3 percentage points lower.

In Poland in 2013 eight out of a hundred companies didn't generate any revenues from the implemented innovations. In 2015 the share increased by 1 percentage point, which is an unfavourable phenomenon. At the same time the percentage of companies generating 26% to 50% of revenues and at least 51% of revenues from innovations decreased by 4 percentage points and 4 percentage points, respectively. What is a positive phenomenon is the growth of the share of companies generating 1% to 25% of revenues from innovations by 7 percentage points.

It is necessary to emphasize that the percentage of companies generating particular shares of revenues from implemented innovations in the USA wasn't far from the average results for the EU in both discussed periods.

The second of the discussed measures of innovative policy is the percentage of companies investing a particular share of their revenues in innovative activity. It turns out that on average in the EU the percentage of companies which didn't invest any part of revenues in innovative activity increased in 2015 by 2 percentage points, compared to 2014, which is an unfavourable trend. At the same time the percentage of companies spending at least 11% of revenues on innovative activity dropped by 1 percentage point. In the comparable period the percentage of companies investing 1% to 5% of revenues and 6% to 10% of revenues didn't change. A positive, but a rather insignificant phenomenon is the growth of the percentage of companies investing less than 1% of revenues in innovative activity by 1 percentage point.

What also serves as proof of the imperfection of innovation policies is the fact that in 14 countries in 2015 the percentage of companies which didn't invest any revenues in innovative activity grew, compared to 2014. This particularly concerns Poland and Romania (growth by 8 percentage points in each case). In 9 countries the percentage of companies investing in innovative activity less than 1% of their revenues decreased. This concerns mostly Lithuania (drop by 8 percentage points). In the revenue share range of 1% to 5% the reduction of the percentage of companies investing in innovative activity was observed in 13 countries and it particularly affected Bulgaria (drop by 10 percentage points). Also in 13 countries the percentage of companies investing 6% to 10% of revenues in innovations decreased. The drop was most visible on Malta (by 6 percentage points). In 19 Member States a smaller percentage of companies invested in innovative activity 11% or less of their revenues, compared to 2014. The biggest drop of this percentage was found in case of Polish companies and amounted to 11 percentage points.

In the USA the percentage of companies which didn't invest any revenues in innovative activity decreased, the percentage of companies which allocated less than 1% of their revenues to this purpose decreased, the percentage of companies investing 1% to 5% of revenues decreased and the percentage of companies allocating to this purpose 6% to 10% of revenues increased. At the same time the share of companies investing at least 11% of their revenues decreased. The level of this indicator wasn't far from the average results for the EU.

These figures don't unequivocally prove the rationality of innovation policies in companies operating in Member States of the European Union, policies which would be focused on dynamic development of innovative activity treated as the main factor for the development of business entities and whole economies. We can presume that one of the reasons for this state of affairs is low level of management on all levels of economic structures: national, regional, company, as is shown by the fact that comparably low and diversified pace of introduction of new products depends on the ability of a company to manage, create and maintain knowledge. In reality every innovation is a result of creative use of knowledge, creating new opportunities by combining new sets of knowledge (Andreeva and Kianto, 2011, p. 1017). At the same time, in practice, managers of companies often decide to invest their limited resources only when these investments lead to raising the capacity of creating values of a business entity. In current times company managements have to optimize the utilization of material and intellectual resources and realize that innovativeness is the main engine of competitiveness and development (Schiuma, 2012, p. 516 and 519). What may help in innovation-focused management, in creating rational innovation policy are the models proposed by the author: national innovation system and integration of the social and technical subsystem in knowledge and innovation management (Baruk, 2014, p. 241 and Baruk, 2009, p. 133).

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[1] These issues are discussed in detail in (Baruk, 2009).

[2] An expression of this concept of management is the "Strategy for intelligent and sustainable development supporting social inclusion". One of its priorities is smart development: the development of economy based on knowledge and innovation. One of the leading initiatives of this strategy is the Union of innovation focused on the improvement of framework conditions for innovations and the use of innovations for solving the most important social and economic problems highlighted in the Europa 2020 strategy (Strategia "Europa 2020", 2015, p. 1; Komisja Europejska, 2010, p. 5).

[3] Innovation policy has become a key problem in many countries. There is growing awareness of the fact that one of the foundations of an efficient policy/strategy of innovation is professional and developed local infrastructure of knowledge. (Nijkamp, Stough and de Noronha Vaz, 2007, p. 633).

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