

Sadłowski, Adam; Stępkowski, Paweł

Article

Innovation in Polish enterprises over the period of 2008-2016

Central and eastern european journal of management and economics

Provided in Cooperation with:

University in Wrocław

Reference: Sadłowski, Adam/Stępkowski, Paweł (2019). Innovation in Polish enterprises over the period of 2008-2016. In: Central and eastern european journal of management and economics 7 (1), S. 127 - 141.

http://ceejme.eu/wp-content/uploads/2019/04/ceejme_1_9_art_09.pdf.

doi:10.29015/ceejme.803.

This Version is available at:

<http://hdl.handle.net/11159/6517>

Kontakt/Contact

ZBW – Leibniz-Informationszentrum Wirtschaft/Leibniz Information Centre for Economics
Düsternbrooker Weg 120
24105 Kiel (Germany)
E-Mail: [rights\[at\]zbw.eu](mailto:rights[at]zbw.eu)
<https://www.zbw.eu/>

Standard-Nutzungsbedingungen:

Dieses Dokument darf zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden. Sie dürfen dieses Dokument nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, aufführen, vertreiben oder anderweitig nutzen. Sofern für das Dokument eine Open-Content-Lizenz verwendet wurde, so gelten abweichend von diesen Nutzungsbedingungen die in der Lizenz gewährten Nutzungsrechte.

<https://savearchive.zbw.eu/termsfuse>

Terms of use:

This document may be saved and copied for your personal and scholarly purposes. You are not to copy it for public or commercial purposes, to exhibit the document in public, to perform, distribute or otherwise use the document in public. If the document is made available under a Creative Commons Licence you may exercise further usage rights as specified in the licence.

Innovation in Polish enterprises over the period of 2008-2016

Adam SADŁOWSKI, Paweł STĘPKOWSKI

Abstract:

Aim: this paper outlines and evaluates – on the basis of selected statistical indicators – the changes in the level of innovation among Polish enterprises over the period of 2008 -2016, with innovation representing one of the main sources of competitive advantage.

Research method: in this paper, a theoretical study of the issues is conducted, using literature research as one of the research methods, while the elementary methods of descriptive statistics were employed in the analysis of the innovation dynamics of Polish undertakings over the period 2008-2016.

Conclusions/findings: the analysis shows a low level of innovation and a low rate of its growth on a nationwide scale.

Originality/value of the paper: in the author's view, the paper can be used by entrepreneurs who wish to implement innovative solutions in their companies, as well as by the government, since it identifies the shortcomings of the cohesive innovation policy. The paper also shows how to make the pro-innovation policy more attractive.

Research implications: the paper may contribute to increased innovation in Polish enterprises.

Key words: innovation, economic competitiveness, innovation policy.

JEL: O31, O32.

1. Introduction

The twenty first century is – and will certainly continue to be – an age of rapid economic and technological changes brought about by the growing and deepening global competition. What is becoming one of the driving forces behind those changes is innovation, as it determines the directions of the structural changes in the economy, effectiveness of technologies employed, the rate of productivity growth, and ultimately international competitive position. Countries seeking to be competitive at the international and global market have to create conditions fostering innovation (Bieńkowski et al., 2010: 582).

The existing sources of the Polish economic success such as relatively low labor costs, the availability of plenty of inexpensive raw materials, the abundant inflow of the Union funds and indirect foreign investment are not enough to sustain this success over the upcoming years and decades given that the rapidly growing economies of the new economic powers can produce most of the goods offered by Polish companies at a considerably lower cost and a quality that is at the very least comparable. Therefore one has to continuously search for new sources that would allow for gaining competitive advantage and modernizing the national economy; innovation not only can but should be such an element – nationally and regionally as well as on the scale of individual economic entities. In order to be able to develop effectively and dynamically, every undertaking needs not only systematic changes in production and organization but also innovations, i.e. putting into the manufacturing process modern products, new technologies, new systems of organization, management, marketing etc. (Bieńkowski et al., 2010: 582).

What decides about the role played and position held by a company (be it a small or medium-sized enterprise or a large international corporation), a region or a country is whether it has the ability to create and absorb innovation. Innovative entities have a particular importance and so one of the primary goals for such undertakings, as well as for the functioning of the regions and countries, is to strive for innovation at the highest possible level.

2. The concept of innovation and innovativeness

The multitude of the definitions referring to the concept of innovation stems from the specificity of the research subject itself, but also how it is approached and whether innovation is conceived of as a process or as its effect (Janasz, Koziół 2007: 15).

In the colloquial understanding, innovation (Latin *innovatio* - new) is any change which improves something, gives a new quality or enables one to create a new product or service (*What is innovation...*); it is also a series of operations designed to create new or improved products, technological processes or organizational systems (Innovation), or it is also the entrepreneurs' ability and motivation to search continuously and use in practice the findings produced by scientific studies and development work, new concepts, ideas and inventions (Grodzka, Zygierewicz, 2008: 1). Thus, innovation refers to any good, service or ideas of them which one would perceive as new. An idea may have existed for a long time, and yet it represents an innovation for somebody who sees it in a new way (Kotler, 2009: 322).

Defined for the first time rather narrowly in legal terms within the meaning of the Act on some forms of support for innovative activity, innovation is an activity which consists in developing a new technology providing the basis for launching the production of new or significantly improved goods, processes or services (Act on some forms of support for innovative activity, Article 2).

In line with the GUS (Statistics Poland) definition, innovative activity is a series of scientific (research-based), technological, organizational, financial and commercial operations whose objective is the development and implementation of new or improved products and processes, whereby those products or processes are new at least from the perspective of the enterprise which launches them. Thus, innovative activity is associated with the enterprises' involvement in various scientific, engineering, organizational, financial and commercial operations which lead or are intended to lead to the implementation of innovation (*Działalność innowacyjna przedsiębiorstw*, 2016: 17).

It is from the concept of innovation and innovative activity that innovativeness emerges, understood as a set of competences and abilities of an undertaking such that it can create or implement a novelty of various types. Innovativeness denotes the ability to discover innovation sources (in the environment), to absorb them and subsequently generate one's own innovations. Undertakings are considered to be innovative if they are capable of creating, absorbing and selling new products or services, as well as those which are characterized by their ability to adapt to the changes taking place around them (Skrętowicz, Kożuch, 2013: 52). An enterprise that is capable of creating innovations, or obtaining them outside and then absorbing them, as well as obtaining

information on innovative solutions applied in other enterprises becomes an innovative enterprise (Bogdanienko, 2004: 59).

Innovation usually comes into being as a result of collaboration between science and business; however, this approach is slightly stereotypical as it is associated with the desired model of economic development. The B+R entities or technology parks are certainly important, yet they are not the only places where innovations are born. Nor are they exclusively an outcome of collaboration between scientific and business communities. Enterprises are also capable of creating innovations without involvement of the research sector, especially when this sector is weak and the technologies it creates fail to address the needs of enterprises or cannot be employed in practice (*Where is innovation born?*).

3. Types of innovations

Innovation policy must exert influence on enterprises, in that it shapes their behaviors, and on the environment in which these undertakings operate. However, there are various ways leading to innovation and innovativeness considering that innovation can come both as an invention and a new approach towards running a business. This is why – next to the concept of innovation – there are more specific concepts – technological, organizational or marketing innovation. The most popular manual on innovation and innovativeness, which is Oslo Manual, introduces new typology of innovation encompassing four types of innovation, namely (Nowak, 2012: 157):

- product innovations (technological or technical innovation) – are considered to be the most significant since they bring the highest added value and (potentially) the highest income for an enterprise, yet they are at the same time the most expensive. Technological innovations contribute to product and service development as they build on the findings produced by scientific and research as well as R&D work. This type of innovations is often the source of further innovations in terms of organization and process;
- process innovations – tend to involve technical innovations referring to the changes in the production process or provision of services;
- organizational innovations – involve changing the way in which an enterprise operates, changing workplace organization and how management is organized. They are often on a no-cost basis because they relate to rationalization of organization or adapting it not only to changing legal regulations, but also to the consumers' demands;

- marketing innovations – refer to the area of sale and distribution of ready-made products and services, which include, e.g. new packaging, new product promotion or pricing.

Thus, innovations are not merely inventions within the area of cutting-edge technologies, since they also involve new products, new processes, new methods of organizing economic and social operations (Guzik, 2004: 33).

3. The scale of innovativeness in Polish enterprises

The importance of innovation policy and innovativeness itself results largely from the great role innovations, both technological and organizational, play in economic growth (Jurkowska 2009: 295). The contemporary development trends across the economies in high developed countries suggest that gaining competitive advantage in a knowledge-based economy is no longer possible without improving the level of innovativeness – it is the only thing that can ensure sustainable economic development and ultimately significant civilisational progress (Dworak, Kasperkiewicz, 2011: 73).

It is then innovativeness that is one of the key challenges faced by societies in the early twenty first century (Guzik, 2004: 33). It defines the competitive position of countries, federations of states (including the EU), as well as regions of which these countries are composed (Dworak, Kasperkiewicz, 2011: 73). In this respect, however, there is still much to be done, in particular in Poland, where the innovativeness level of our economy continues to be low compared to the vast majority of the EU Member States (Radomska, 2010).

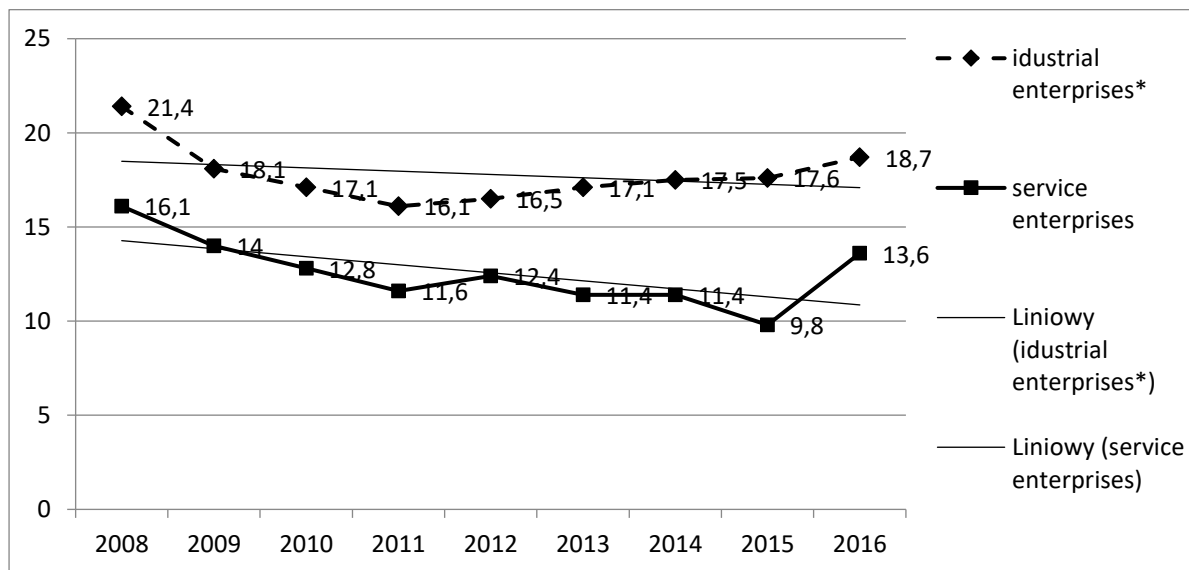
The trends in terms of innovativeness across Polish enterprises can be followed, inter alia, based on how selected indicators have been developing (Radomska, 2010). Most studies and statistics suggest low innovativeness in Polish enterprises although the high rate of economic growth and Polish export seem to confirm the good condition which our enterprises enjoy, and therefore the availability of financial resources.

In this paper the analyzed indicators were confined only to key ones, namely, the level of outlays and the number of innovative enterprises (absolute and relative values) and the innovations implemented broken down according to their categories, as available in statistics. In line with the definition offered by Statistics Poland, an actively innovative enterprise is one which implemented at least one product or process innovation over the period at issue, or had at least one innovative

project interrupted or abandoned during the period examined or a project that was not completed by the end of this period.

The proportion of innovative enterprises among both industrial and service companies was relatively small (see Fig. 1), with the percentage of industrial companies being higher by several percentage points than that of service companies (the smallest differences were at a level of 4.1 percentage point in 2009 and 2012, while the biggest at 7.8 percentage point was recorded in 2015). The downward trends could be observed relatively clearly among industrial as well as service companies, with industrial companies seeing a 12.6%- decline, which makes its average rate at 1.37%, while for service companies, the declining trend was at 15.5%, with its average rate equal to 1.41%. For industrial companies, the lowest percentage of innovative enterprises occurred in 2011, followed by a slight but steady upward trend, whereas service enterprises continued to experience decline over the next years until 2015 (the year 2012 saw a very small one-off increase, while 2016 recorded a relatively large increase).

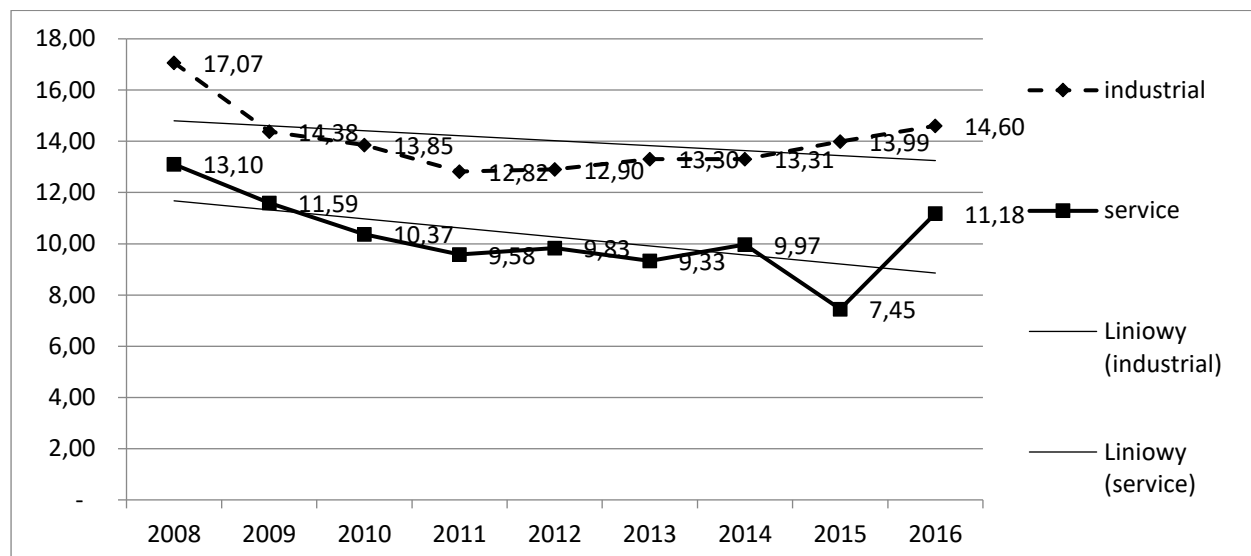
Fig. 1 A proportion of innovative enterprises in total number of enterprises (%)



*industrial enterprises with a workforce of over 10 people.

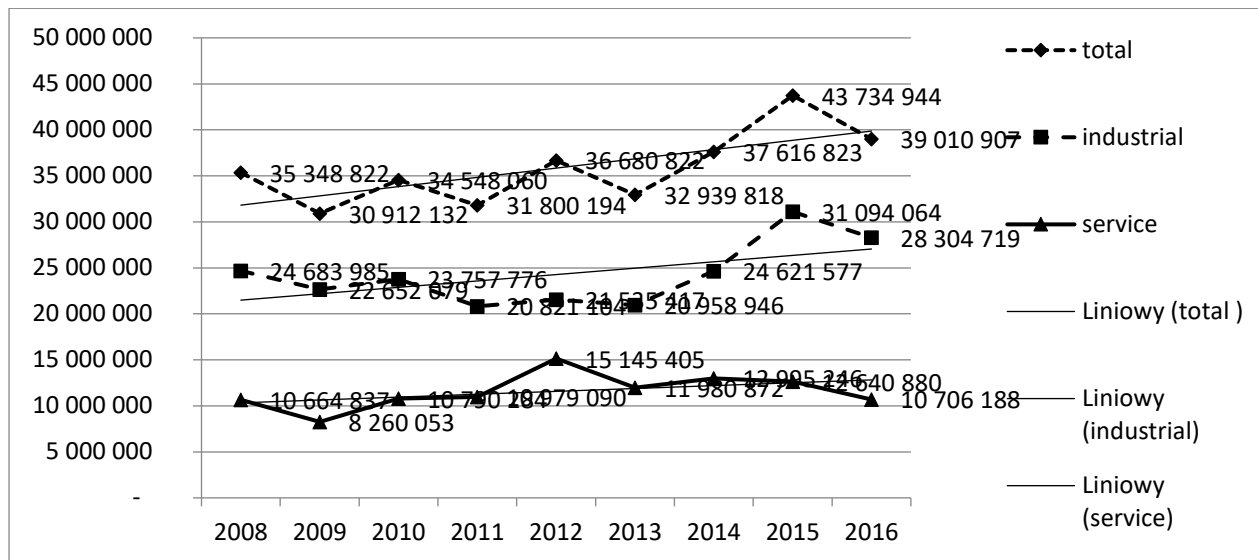
Source: innovation in enterprises over the period of 2004-2016, a study by Statistics Poland, Statistical Analysis Series, Warszawa-Szczecin 2017.

The percentage of innovative enterprises, i.e. those which incurred expenditures on innovations was very low (see Fig. 2).

Fig. 2 Percentage of enterprises which incurred expenditures on innovations


Source: Local Data Bank of Statistics Poland, <https://bdl.stat.gov.pl/BDL/dane/podgrup/tablica>.

Over the period 2008-2016, the percentage showed clearly a downward trend, with the final percentage being lower by 14.0% than the original one for industrial enterprises and by 15.3% for service enterprises, which produced an average rate of decline at a level of 1.4% for industrial and service enterprises. The trend estimation, however, was different between industrial and service enterprises. For industrial enterprises, the lowest percentage of innovative companies was recorded in 2011, which was lower than the initial one by 24.9% - over the following years a slow growth trend was to be observed, while for service enterprises the year 2015 saw the lowest percentage, which was lower by 43.1% than the initial one, yet a very big increase of up to 49.0% was recorded in 2016.

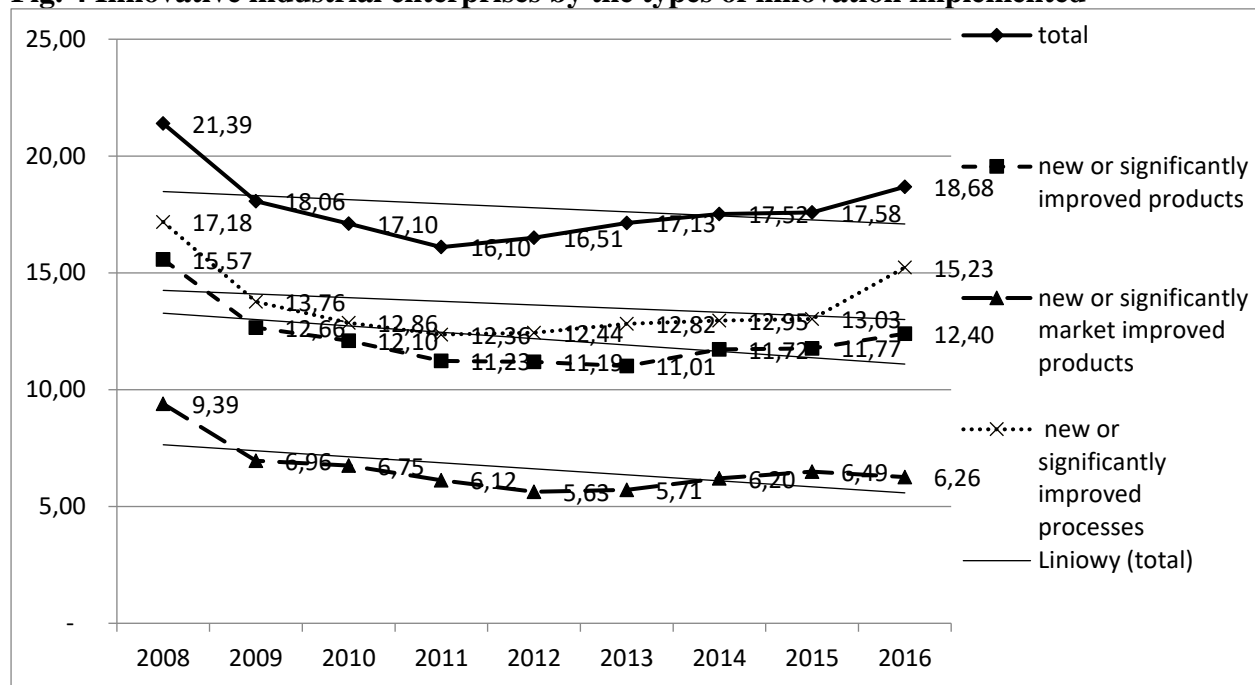
Fig. 3 The value of the enterprises' expenditures on innovation (PLN thous.)

Source: Local Data Bank of Statistics Poland, <https://bdl.stat.gov.pl/BDL/dane/podgrup/tablica>.

The level of expenditures on innovations, for enterprises overall, as well as those classified as industrial and service enterprises showed a growing trend (se Fig. 3).

The trend, however, was rather weak and unstable, and on top of that – for both groups (industrial enterprises and service enterprises) – it showed a highly different variation in time. Over the period of 2008-2016, total expenditures on innovations grew by no less than 10.4% (although in 2015, when this level was at its highest it was equal to 23.7%); in industrial enterprises it was 14.7%, while service enterprises saw only 0.4%. This, however, was brought about not as much by small increases, since these were relatively high, as by the downward trend taking its hold - from 2015 for industrial enterprises, and for service enterprises since 2012, a year when the level of expenditures on innovation reached its maximum.

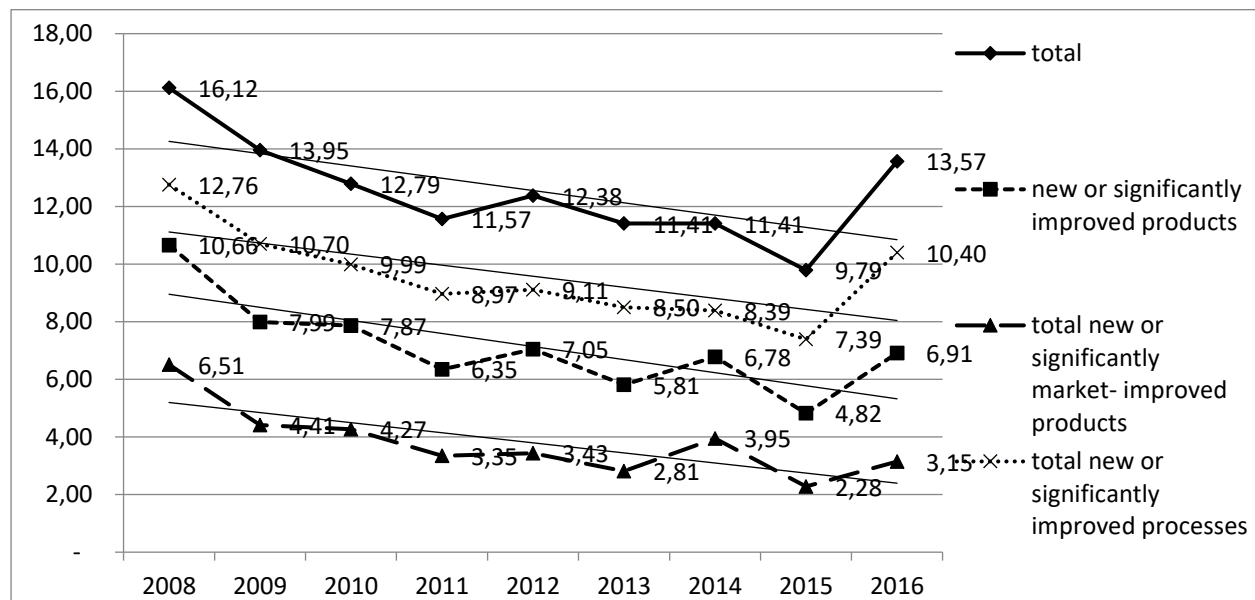
The type structure of innovation among industrial enterprises was relatively stable (see Fig. 4).

Fig. 4 Innovative industrial enterprises by the types of innovation implemented


Source: Local Data Bank of Statistics Poland, <https://bdl.stat.gov.pl/BDL/dane/podgrup/tablica>.

The vast majority of innovations implemented by Polish industrial enterprises involved launching new or significantly improved processes. A slightly lower percentage represented new or significantly improved products launched into production, with the percentage of companies implementing products which were new or significantly improved for the market representing a considerably lower level. For all these forms of innovations a downward trend was observed although it was brought about by the different rate of variations over time. While the overall percentage of innovative industrial enterprises, following the decline over the period of 2008-2011, grew slowly over the next years (this percentage showed similar variations for enterprises which implemented new or significantly improved processes), the period of decline for enterprises which implemented new or significantly improved products spanned the years 2008-2013; enterprises launching new or significantly improved products for the market were in decline over the period of 2008-2012, yet after the growth which lasted until 2015, there was decline once again in 2016.

The type-based structure of innovations among service enterprises was stable (see Fig. 5).

Fig. 5 Innovative service enterprises by types of innovations implemented

Source: Local Data Bank of Statistics Poland, <https://bdl.stat.gov.pl/BDL/dane/podgrup/tablica>.

The vast majority of innovations introduced by Polish service enterprises referred to implementing new or improved processes, the same as in industrial enterprises; the percentage of new or significantly improved products implemented was at a lower level, with enterprises launching new or improved products for the market representing a considerably lower level (in this case the products were the services provided). As in industrial enterprises, here also a downward trend was recorded, yet its intensity was considerably stronger. What was similar across all the types of innovation implemented in service enterprises was that for all the types the lowest level of implementations was observed in 2015 (in the preceding period the falls alternated with growth each year) and in 2016 one could observe clearly a rather strong growth momentum.

The analysis of the data on innovative activities in enterprises in Poland over the period of 2009-2016 prepared by Statistics Poland shows a simultaneous increase in expenditures on innovations (among industrial as well service enterprises), and simultaneous decline of the percentage of innovative enterprises in relation to the total number of enterprises, whereby what became a lasting trend was that the proportion of innovative enterprises in industry was higher than in services. Moreover, process innovations were becoming more prevalent than product innovations, although it is the latter which builds the competitiveness of an economy.

There exists a very large group of very innovative undertakings in Poland, including also those potentially innovative which, however, have been unable to “pierce through” the numerous, in particular, administrative and financial barriers with their innovations (Baczko).

5. Barriers to innovation development in Poland and mechanisms supporting innovation

Implementing an innovation is not an easy process; it requires considerable knowledge and – first and foremost – endurance and patience on the part of entrepreneurs (*From creation to implementation...*).

One of the barriers hindering economic innovativeness in Poland is the low level of outlays on research and development (Radomska, 2010). This low level is mainly affected by the fact that the level of non-public resource allocation is too low, especially by enterprises (Grodzka, Zygierewicz, 2008: 2).

The reasons behind this insufficient involvement in funding the R&D area by the private sector could be attributed, among other things, to high costs and significant risk (uncertainty as to the outcome produced) associated with this type of activities (Grodzka, Zygierewicz, 2008: 2). The implementation of innovative solutions is risky, at times difficult and utterly unpredictable, with the results produced often failing to meet the expectations and aims of the innovation process (Horodyska). Consequently, the Polish enterprises are afraid of taking risks (Warzybok, 2007: 10), also given that many innovative projects do not guarantee success, especially at its initial stages when a completely new concept of a product or service is being created and money invested in an idea which might fail to be successful. Nor is there public acceptance for a failed idea in Poland, which is why Polish entrepreneurs tend to be very conservative. As a result, home-grown companies do not come up with their own innovative solutions that would become the driving force for the economy but they merely copy well-known solutions from the West (Ciepiela).

Many undertakings do not have their own research and development funds, while the banks are still unwilling to provide loans for this type of projects. What is also lacking is venture capital funds investing in small projects which, in plenty of countries, represent an important instrument for implementing scientific, R&D and innovative activities into commercial practice (Grodzka, Zygierewicz, 2008: 2). What is also a certain barrier to innovation is the considerable dispersion of aid schemes and institutions providing support, with each voivodship having its own strategy and programs (Ciepiela).

Nevertheless, the entrepreneurs in Poland have considerable expectations of the institutional environment and the instruments of pro-innovation policies; they take notice of multiple inconveniences, bureaucratic barriers and significant costs involved in preparing projects. These expectations are accompanied by the feeling that the allocation of private and public funds does not focus on the individual needs of the most innovative entities; quite the opposite – the innovation policy is perceived as inconsistent and incapable of taking into account the dynamics guiding the changes which are taking place (Baczko).

The innovation policy is one of the economic policies representing the combination of elements involved in science policies and technological policies, and as such encompassing, *inter alia*, the following (Kozioł, 2005):

- strengthening the links in the national system of innovation,
- developing and enhancing the capabilities of innovation implementation in the area of technique and technology, as well as organization and education,
- using international collaboration and globalization processes in the economy.

Considering the phenomenon of market failure in terms of self-regulation, which in itself with no government support is incapable of ensuring innovativeness of the economy at an optimal level – from the socio-economic perspective (economic competitiveness, regional development, an increase in employment) – one should regard as necessary the interference by the government and its bodies in the process aimed at stimulating innovativeness of economic entities. The impact of the innovation policy should be directed mainly at enterprises which take the risk should innovation fail (Jurkowska, 2009: 296).

Innovation policies of every country are shaped by the impact of specific determinants such as: historical experience, spiritual and material culture, the level of human capital development, and legal and institutional settings. However, in Poland they have failed to engender a positive tradition (Jurkowska, 2009: 295).

Whatever their size, Polish enterprises need support and a considerable “cash injection” so as to be able to boost their innovativeness, and yet increasing expenditures on innovations without changing their structure will certainly not suffice. The procedures and criteria for granting any kind of financial aid should be set in such a way as to support truly innovative projects and not merely reproductive activities such as purchasing machines or renovating old industrial facilities. The procedure should also take into account the fact that a considerable number of projects is bound to

fail, since failure is an inherent part of the innovation process; yet the aid schemes currently in place do not provide for this possibility (Ciepiela).

However, for making a significant progress in the field of innovation what is first and foremost required is an innovation strategy built and pursued in real terms, based on the diagnosis which takes into account new and dynamic phenomena and manifestations of international competitiveness, while its key elements should include eliminating the bureaucratic barriers, building information policy drawing on the best international standards, taking measures promoting innovation in the public sector and increasing cohesiveness of these policies. It would be extremely difficult to pursue a policy fostering innovation with no information on its level, growth potential and competitiveness of economic entities (Baczko, 2018).

6. Conclusions

Innovative processes, and in particular product, process, organizational and marketing innovations emerging as their result, are one of the main factors raising the competitiveness of a domestic economy and of the economies of individual regions, and therefore it is innovation that not only can but even should be a fundamental factor for success of every organization. Polish enterprises seeking to sustain their competitive position, not only on the domestic but in particular on the global market, have to meet the challenge of implementing innovations systematically.

Unfortunately, the present level of innovation in the Polish enterprises has been relatively low showing no lasting improving trend in this unfavorable situation.

The findings of the analysis above (even if the analysis and the assessment of the state of innovativeness in the Polish enterprises be incomplete) lead to the self-evident conclusion that the innovativeness level found across industrial as well as service enterprises is far too insufficient, while the innovation policy pursued in Poland is not sound. This low level of innovation is largely caused by the administrative and financial barriers in place, including the fact that the research and development area is insufficiently funded, and the mechanisms used for transferring research outcomes into commercial practice are not sufficiently developed.

Increasing the level of innovation in the Polish economy requires in the first place that the government devise and implement a cohesive innovation Policy as a horizontal policy, integrating the science and technological policies with industrial policies, with the horizontal policy being a viable economic policy and not a set of wishes and proposals, which, although absolutely right, are

not feasible. The new instruments and solutions aimed at promoting innovation have been implemented in Poland for a dozen of years, yet their effects and impact on the competitiveness of the economy will become manifested gradually not before the next years and decades.

Significant barriers to innovation are also rooted in the enterprises themselves such as having no innovation strategy developed and no motivation schemes which would stimulate creativity and innovativeness. In Poland, what is acutely felt is the lack of mechanisms designed to encourage entrepreneurs to increase expenditures on innovative activities or mechanisms promoting innovation. Ultimately, for the level of innovation to grow in Polish enterprises what is needed is to develop an effective pro-innovation policy at the central level along with adequate financial, legal and organizational instruments supporting the entrepreneurs who search for innovations and want to implement them.

References

- Baczko T., Polska nie jest innowacyjna (Poland is not innovative), <https://www.obserwatorfinansowy.pl/tematyka/makroekonomia/polska-nie-jest-innowacyjna/> [18.10.2018].
- Bank Danych Lokalnych Głównego Urzędu Statystycznego (Local Data Bank of Statistics Poland), <https://bdl.stat.gov.pl/BDL/dane/podgrup/tablica>.
- Bieńkowski W. et al. (ed.) (2010). Konkurencyjność Polski na tle zmian gospodarczych w krajach OECD. Ewolucja znaczenia czynników konkurencyjności, Wydawnictwo SGH: Warszawa.
- Bogdanienko J. (2004). Innowacyjność przedsiębiorstw, Wydawnictwo UMK: Toruń.
- Ciepiela D., Polska gospodarka nie jest innowacyjna (Polish economy is not innovative), http://logistyka.wnp.pl/polska-gospodarka-nie-jest-innowacyjna,197133_1_0_0.html [19.10.2018].
- Co to jest innowacja? (What is innovation?), http://www.pi.gov.pl/Firma/chapter_95851.asp [19.10.2018].
- Dworak E., Kasperkiewicz W. (2011). Innowacyjność polskiej gospodarki: ocena – uwarunkowania – strategia), Acta Universitatis Lodzensis 2011, Folia Oeconomica No 248.
- Działalność innowacyjna przedsiębiorstw w latach 2013-2015, Devised by Statistics Poland, Seria Analizy Statystyczne, Warszawa – Szczecin 2016.
- Działalność innowacyjna przedsiębiorstw w latach 2014–2016, Devised by Statistics Poland,, Seria Analizy Statystyczne, Warszawa – Szczecin 2017.
- Gdzie się rodzi innowacja? (Where is innovation born?), http://www.pi.gov.pl/Firma/chapter_95074.asp [19.10.2018].
- Grodzka D., Zygierecz A. (2008). Innowacyjność polskiej gospodarki, Biuro Analiz Sejmowych (Sejm's Office for Analyses, Socio-economic issues), Zagadnienia społeczno-gospodarcze 27 March 2008, No 6 (30).
- Guzik R. (2004). Przestrzenne zróżnicowanie potencjału innowacyjnego w Polsce, Zeszyty Innowacyjne CASE 2004, No 2.

Horodyska G., Kto inicjuje innowacje w firmie? (Who initiates innovation in a company?), http://www.pi.gov.pl/Firma/chapter_95715.asp [19.10.2018].

Innowacja, <https://mfiles.pl/pl/index.php/Innowacja> [18.10.2018].

Janasz W., Kozioł K. (2007). *Determinanty działalności innowacyjnej przedsiębiorstw*, PWE: Warszawa.

Jurkowska B. (2009). *Analiza poziomu innowacyjności polskiej gospodarki a polityka innowacyjna państwa*, Studia Lubuskie 2009, vol. V.

Kotler Ph. (2009). *Marketing. Analiza, planowanie, wdrażanie i kontrola (Marketing, analysis, planning and implementing)*. Felberg SJA: Warszawa.

Kozioł K. (2005). *Modele polityki innowacyjnej w Unii Europejskiej*, w: *Innowacje w działalności przedsiębiorstw w integracji z Unią Europejską*, ed. Janasz W., Difin: Warszawa.

Nowak P. (2012), *Poziom innowacyjności polskiej gospodarki na tle krajów UE (Innovation level in Polish economy against EU countries)*, *Prace Komisji Geografii Przemysłu* 2012, nr 10.

Od wytworzenia do wdrożenia innowacji (From innovation creation to its implementation), http://www.pi.gov.pl/Firma/chapter_95075.asp [19.10.2018].

Penc J. (1999). *Innowacje i zmiany w firmie*, Placet: Warszawa.

Radomska E. (2010). *Innowacyjność polskiej gospodarki i przedsiębiorstw. Bariery i wyzwania (Innovativeness in Polish economy and enterprises. Barriers and challenges)*, *Sztuka zarządzania*, part. I, *Magazyn biznesowy i akademicki POU* July-August 2010, No 2-3.

Skrętowicz B., Kozuch J. (2013), *Przedsiębiorstwa innowacyjne w Polsce w świetle Wspólnotowego Badania Innowacyjności (CIS)*, in: *Współczesne aspekty rynku pracy (Contemporary aspects of the labor market)*, ed. Organiściak-Krzykowska A., Publisher: UWM: Warszawa-Olsztyn.

Ustawa z dnia 30 maja 2008 r. o niektórych formach wspierania działalności innowacyjnej (Act of 30 May 2008 on some forms of support for innovative activity), J.L. No 116, item. 730.

Warzybok A. (2007). *Realizacja celu barcelońskiego polityki badawczo-rozwojowej Unii Europejskiej na tle 6. Programu Ramowego – niewykorzystana szansa czy zbyt wysoko postawiona poprzeczka?*, *Zeszyty Naukowe Zakładu Europeistyki Wyższej Szkoły Informatyki i Zarządzania w Rzeszowie* 2007, No 1 (3).