

Walicka, Monika; Prystrom, Joanna

Article

R&D tax incentives for innovation and managerial decisions

e-Finanse: Financial Internet Quarterly

Provided in Cooperation with:

University of Information Technology and Management, Rzeszów

Suggested Citation: Walicka, Monika; Prystrom, Joanna (2015) : R&D tax incentives for innovation and managerial decisions, e-Finanse: Financial Internet Quarterly, ISSN 1734-039X, University of Information Technology and Management, Rzeszów, Vol. 11, Iss. 4, pp. 46-56, https://doi.org/10.14636/1734-039X_11_4_004

This Version is available at:

<https://hdl.handle.net/10419/147142>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



R&D TAX INCENTIVES FOR INNOVATION AND MANAGERIAL DECISIONS

MONIKA WALICKA¹, JOANNA PRYSTROM²

Abstract

In many countries tax incentives are a popular means of realizing political, economic and social objectives. The main motive of their application is often to achieve and accelerate the selected activities in the public interest and also stimulate development of industry, and induce growth in research and investment. The key element that helps a company achieve a competitive advantage is innovation. Global competition forces the production of unique products and services. Tax incentives in science, research and development are important in stimulating innovation. The purpose of this article is to show the level of managerial awareness about R&D tax incentives, the level of R&D tax incentive usage by companies in Poland, and main obstacles that managers meet with R&D tax incentives in practice. We explore R&D tax incentives as a government instrument on R&D management and aim to find the reasons why Polish companies do not take advantage of them. We examine 275 companies using a semi-structured questionnaire. Our findings suggest that many firms report lack of knowledge about such incentives, and firms find many obstacles to reach all of the requirements which are necessary to use the incentive. Due to our analysis we find that large firms, especially those that implement innovation, are more likely to use the tax incentives, but small and medium sized companies find more obstacle. The effect of this tax policy is significant mainly in large, high-tech sector firms.

JEL classification: L20, G38, H25

Keywords: tax incentives, research and development, innovations

Received: 31.05.2015

Accepted: 23.02.2016

1 Białystok University of Technology, Department of Finance and Accounting, m.walicka@pb.edu.pl.

2 Białystok University of Technology, Department of Economics And Social Sciences, j.prystrom@pb.edu.pl.

INTRODUCTION

Research and development tax incentives have been widely applied by governments throughout the world over the past 40 years. Tax incentives have also become a popular policy instrument to stimulate investment in research and experimental development through various forms of tax reliefs. The popularity of this instrument arises from the simplicity of its implementation through the system of corporate taxation, implying low administrative costs (Kohler et al., 2012). In Poland it is connected mostly with tax reliefs, but the catalog of these preferences is much poorer than in other EU countries. The imperfection of the instruments available to support R&D is also confirmed by reports in which Poland occupies the final position in rankings of innovation and is one of the few countries where the companies for each euro spent on R&D are subsidized just two cents (Europe 2020, 2010). In February 2013, in France, with one dollar spent the company can recover 43 cents, 41 cents in Portugal, 45 cents in Spain, 27 cents in the Czech Republic, 22 cents in Hungary. In 2011, expenditure on research and development in Poland was 0,77% of GDP, compared to 0,63% of GDP a year earlier. Meanwhile, the EU average was 1,26%, Sweden – 3,37% of GDP in Denmark – 3,09%, and in Germany - 2,8%¹.

Considering the dynamics of changes, it should be noted that there was a significant increase in R&D activities. In 2012, among the number of 93 R&D centers (RDC)² there were created 54 technology parks, 69 technology transfer centers and 182 clusters (Business, 2012, p. 31). The greatest potential for R&D development is found in industries such as: automotive, aeronautical, electronic, telecommunications network, IT, biotechnology and biochemical engineering, medical and pharmaceutical, construction, robotics and nanotechnology (Science and technology in 2011, 2012). To support their further development and thus raise the level of innovation in

the Polish economy, special sectoral programs were prepared. But fiscal incentives for stimulating investment in research and development are common in most developed countries. Globalization and new technologies pose newer challenges for management, and for the efficient management of innovation it is necessary to not only employ highly skilled staff, but to receive help in the form of tax credits from the state.

We start from a literature review on R&D incentive mechanisms and innovation policy. Then we present the types of financial and tax support for R&D business activity in Poland. Next, we introduce the data sources and present the research results. Finally, we discuss the effect of research and the role of tax incentives in R&D in business activity in Poland. In March 2015, we examined 1100 top executives, R&D directors, technical managers and other professionals to obtain detailed results. We used CATI method in each step of the research. That allowed us to obtain 275 active operating companies running R&D activities. Data cover the period 2011-2014.

The concept of technological innovation which is used in this article relies on a definition by the Oslo Manual (2005) that is close to that presented by Schumpeter (1912). Innovation is a critical organizational outcome for its potential to generate competitive advantage. While the contribution of knowledge to the generation of innovation is widely recognized, little is known about how organizational incentive mechanisms stimulate or inhibit company manager behaviors that promote innovation (Yanadori & Cui, 2013).

INCENTIVE MECHANISMS TO ENCOURAGE INNOVATION – THEORETICAL REVIEW

The literature review generally focuses on studies that econometrically analyze the impact of R&D tax incentives on the key policy goal - to raise R&D spending by enterprises (Trandafir & Luminita, 2014). Previous studies also based on firm-level panel data and tend to analyze the effects of changes in the generosity of R&D tax incentives (Hall & van Reenen, 2000). In recent years, control groups of companies have been more often used to compare firms that use R&D tax incentives with those that do not (Czarnitzki et al., 2011; Trandafir & Luminita, 2014; Graetz & Doud, 2013). Also, the importance of R&D activities is sustained by the new economic trend that relies on the increasing role of knowledge for economic

1 Read more: *EUROPE 2020. A strategy for smart, sustainable and inclusive growth*, COM (2010). 2020 European Commission. Brussels: Friedrich-Ebert-Stiftung Group, *Paving the Way for a Sustainable European Prosperity Strategy*, International Policy Analysis (2010); Hacker, B., Jakobi, A.P., Petzold, S., Pusch, T., Steinberg, P. (2010). *Europe 2020 – proposals for the Post-Lisbon strategy: progressive policy proposals for Europe's economic, social and environmental renewal*. International Policy Analysis. Berlin: Friedrich-Ebert-Stiftung; Eurostat, (2012). *Research and development: annual statistics*, Brussels.

2 The RDC status is assigned by the Minister of Economy upon request of the company, which must meet the following criteria: net sales in the previous fiscal year must be at least 1,2 million, revenue from the sale of internal R&D services or industrial property rights must be 20% of total revenues and the company cannot fall behind on public contributions.

growth and competitiveness.

R&D tax incentives in the EU have become more important in the last decade, as expressed by the EU 2020 strategy, where R&D is one of two main objectives and priorities. Expenditures on research and development are important issues for the economic growth of a country (Moncada-Paterno-Castello, 2010, p. 523). Governments take steps towards reallocating or attracting domestic and foreign capital through fiscal instruments, involving favorable tax treatment of some businesses (Klemm & van Parys, 2012, p. 393-423). Tax policy plays an important role in stimulating research and development; in some way it removes or reduces the high risk associated to this category of investment (Hodžić, 2013, p. 51-62; Tassej, 2007).

Emerging economies attract investors through the adoption of income tax rates (Badea, Preda & Constantinescu, 2009, p. 165-167). But globalization stimulates countries to assess their own permanent tax systems and adopt adjustment measures to improve the tax climate for investment. Technological innovation is important for economic growth (Walicka, 2014, p. 73-81), nations strive to stimulate and attract the research and development that leads to that innovation and to make hospitable environments for the holding of intellectual property. Tax policies assist in the accomplishment of these goals and the capture of a share of the income from technological innovations. Where R&D is performed and where income is earned change in response to the nature and level of government support (Graetz & Doud, 2013, p. 347). Other findings suggest that the tax authorities should simplify their systems (Ming Ling & Arifin, 2012, p. 11-24). It confirms the thesis that tax complexities can impact directly on R&D in the business world, but there still is a need to identify the significant effects of the tax systems on R&D (Sakata et. al., 2005) and to explore the role of tax on R&D activity of firms as tax incentives affect the level and efficiency of R&D investments (De Waegenare et. al., 2012, p. 1197).

In order to increase innovativeness, companies need to supplement their internal resources and explore new solutions through mutual interactions (Sanchez-Gonzales & Herrera, 2010, p. 337-335). Science and technology are the key components to building the foundations for innovation, productivity and economic growth. As taxation is becoming increasingly conducive to the development of enterprises, the use of incentives and tax breaks are

proving more popular among companies than the seeking of direct subsidies (Hall & Van Reenen, 2010, p. 449-469).

R&D and innovation are considered in literature mainly for the efficiency and profitability of the company. The level of R&D depends on productivity growth, economic efficiency and social justice (Hutschenreiter, 2001, p. 74-85). Hutschenreiter suggests also that the selection of tax incentives in support of R&D depends on such factors as degree of innovation, perception of market failure in research and development, industrial structure of the country, size of the company, tax policy within the company and fiscal policy of the country (Walicka, 2014, p. 191-201).

There are several definitions of R&D in the European Union. However, the most common are those resulting from the classification of R&D (Frascati Manual, 2005):

- 1) basic research – theoretical or experimental work carried out primarily to acquire new knowledge about underlying foundations of phenomena and facts without the possibility of practical application,
- 2) applied research – experimental or theoretical work done in order to acquire new knowledge, primarily focused on achieving specific goals,
- 3) research and development – work based on the results of scientific research and practical experience, focused on the creation of new materials products, systems and implementation of new processes.

Consequently, among the entities conducting R&D activities we can find those who came from the corporate sector, public sector, non-profit sector and the higher education sector (Science and technology in 2011, 2012, p. 54). The literature assumes that tax incentives take usually one of four possible forms (Kesner-Škreb, 2001, p. 633-636):

- 1) deferral of tax as relief arising from shifting the time of payment of the tax,
- 2) tax reliefs as the possibility of tax deductions for income tax,
- 3) tax reliefs as the form of tax deductions,
- 4) tax credits for tax breaks.

To create tax incentives for R&D it is necessary to use specific rules of the tax system. The priorities should be: simple design, low compliance costs, reliability and stability (Walicka, 2014). Transparent and easily accessible incentives are another feature of the tax system that favors maximizing R&D at companies. Incentives should be stable over time, and only this will

Figure 1: Areas of R&D tax incentives in the EU



Source: Trandafir, A., Luminita, R. (2014). *R&D Tax Relief in the European Union. Economics, Management and Financial Markets*, 9(1), 436

create a reliable framework for businesses, because it will give opportunities to companies to include it in their plans and strategies. The European Commission has created a catalog³ of recommendations for tax incentives related to R&D activities. Regarding the type of R&D activities, Figure 1 present the main domains to which are applied tax incentives.

Tax incentives schemes that operate in EU states are different, but for a better understanding there are various schemes that are applied by (Popa et al., 2012):

- 1) calculation basis for the tax credit for R&D: results or expenses or mixed,
- 2) type of eligible expenses: capital expenses, current expenses, mixed,
- 3) type of tax credit: additional deduction or exemption, cash reimbursement or mixed,
- 4) beneficiary differentiation: by size or by no differentiation.

Most common tax incentives are intended for

³ Fiscal incentives must apply to a group of companies, and provide such a high increase in expenditure on R&D in the business sector as possible. Tax incentives should include all current expenses and exclude certain types of capital expenditure for research and development and focus on immediate effect of tax incentives. Evaluation criteria and data from the phase formation should be taken into account in the design of incentives.

all types of companies, sectors or technologies. The dominant model of tax incentives for R&D is aimed at reducing the tax paid by the company by deducting the cost of research. The usefulness of such incentives is proportional to the effective tax rates and is dependent on the specific conditions of industrial structure, the level of advancement of R&D companies, as well as the macroeconomic situation. Popular is the dichotomous model of R&D by funding basic research performed in academic centers with public funds, and later developing additional stimulation technologies leading to practical implication in the R&D companies (Elschner, 2011, p. 233-256).

One of the priorities for the Polish tax system is to encourage investment in research and development through the creation of a national market for research in the EU and globally. Despite the fact that the domestic market of enterprises active in R&D is characterized by a high level of competition, mobility and high-quality research, economic development is slowed down because of the deficiencies associated with the financing of enterprises engaged in R&D. Currently, more than 30 countries in the world offer a variety of tax incentives to increase

Table 1: Financial and tax support for R&D in Poland

Support	Rules for application
Expenditures on R&D	All expenses incurred in R&D may be set against 100%. Depreciation period is reduced for completed R&D from 36 to 12 months.
Tax incentives for RDC	RDC may establish an innovation fund. The fund is supplied from the monthly charges in the amount of 20% of revenue. RDC can also benefit from the exemption from property tax, agricultural tax and forestry tax.
Tax incentives for new technologies purchase	The reduction of the tax base up to 50% of the expenditure incurred on the purchase of new technology in the form of intangible assets, such as property rights under licenses, rights under a patent or utility model, and know-how. Technology must be purchased to improve existing products/services. In the case of tax deduction a loss may be settled in three common years.
Subsidies and grants	Subsidies from EU funds and Polish government funds cover up to 100% of R&D expenditures.
Tax credits	Financing technology implementation by the loan repaid by the entrepreneur based on the increase in tax revenue.

Source: Own study based on: Deloitte, (2013). *Review of Tax Incentives in the World in 2012*. Warsaw, p. 40-41; Barej, E. (2009). *Financial Support for Research and Development in Poland*. *Oeconomica* vol. 270(55), 5-10; Ministry of Economy, (2012). *Entrepreneurship in Poland (2012)*. Warsaw, 46-48.

investment in research and development through actions to improve manufacturing processes and the integration of software systems. A variety of solutions available in individual countries give businesses new opportunities for tax planning. Polish tax law provides tax incentives for investments in new technologies. Additionally, incentives are available only to entities having the status of Research and Development Centre (RDC). In Poland, companies can also benefit from multiple grant programs for R&D financed from the government grants and EU funds. The scheme of existing Polish tax incentives for R&D activities is presented in Table 1.

In comparison with other countries, the Polish tax system does not provide many incentives to R&D. The main base of R&D support is relief on the purchase of new technologies introduced in 2006 (Act dated 29 July 2005 on certain forms of support for innovative activity, Journal of Laws of 19.09.2005r., (No. 179, item. 1484). The main purpose of the incentive was to encourage entrepreneurs or managers to invest in innovative solutions but only as intangible assets (ex. licences, know-how). It allows for the deduction from taxable income up to 50% of the costs related to the purchase of new technology in the form of intangible assets. In addition, businesses in Poland are restricted by the eligible expenses catalog. The incentive and support is available for the following expenses:

- 1) costs of staff directly involved in R&D projects,
- 2) equipment depreciation used in R&D projects,

- 3) consultancy and other services related to R&D,
- 4) other direct costs.

The list of eligible costs includes only the cost of purchasing technology solutions in the form of intangible assets. Therefore, the costs of internal research, as well as costs reimbursed from other sources of aid, are not eligible for the tax credit for new technologies. In order to benefit from tax relief for the purchase of new technology that technology cannot be used outside the company for more than five years, which must be confirmed by the opinion of an independent research unit. In the case of an inspection, the company should make available the opinion issued by an independent scientific entity confirming that at the time of purchase, the technology was not used in the world for more than five years. The company which makes use of the tax relief cannot give others the rights to the new technology for a period of three years from the tax relief.

The Polish government established a tax incentive for purchase of new technologies in 2007. Since then we can observe that initially only 19 companies have benefited from that relief but, in 2011, their number increased five-fold (Ministry of Economy, 2012, p. 44-45). According to Polish Ministry of Finance reports the relief is more popular among companies subjected to corporate income tax (CIT). In 2007 year, 117 companies used the R&D tax incentive; the number more than tripled in 2010, but in 2011 the popularity of the relief declined significantly.

Considering the total number of enterprises in Poland, despite the increase in the use of this instrument, it still accounts for a small percentage. The amount of deductions made by companies is different and depends on the legal form of the company. Amounts of deductions by PIT taxed companies are several thousand PLN, while companies subjected to CIT deducted millions of dollars. PIT deduction per company were the highest in 2008 and amounted to 464 thousand PLN, while CIT taxpayers peaked in 2011 with 2,7 million PLN. The average amount of deduction is still rapidly growing (Ministry of Economy, 2012, p. 44-45).

SAMPLE AND RESEARCH DESIGN

We examined the tax incentives in managing the R&D activities of firms. The one primary obstacle we encountered was the availability of detailed information on firm usage of R&D incentives. Due to this limitation, this research utilize the dataset collected in three steps. First, we sent the surveys to 1100 companies registered in Poland, established before 2010 and actively operating

in the European Union. The survey contained questions connected to innovations and R&D activities and employment in the period of 2011-2014 and aimed to find companies that are active in R&D. As the result of the first step we identified 275 completed surveys from R&D active companies. Finally, among that sample we found 63 tax incentive users. We used a semi-structured questionnaire (Fowler, 2009), based on the theoretical framework described above, to develop knowledge from the persons interviewed. We interviewed top executives, R&D directors, technical managers and other technical professionals to obtain primary information. Other information was obtained from websites and online searches as previously conducted by Band (2003). Table 2 presents some sample characteristics by sectors.

We found 83 companies conducting R&D activity, 127 innovation and 63 tax incentive users (Table 3). Within the sample of 275 (46%) companies 127 innovation was implemented in the period 2011-2014. This result is very high, but has some limitations. We still should remember that the sample consists 99 large companies (36%), which explains this high percentage of innovativeness among those companies. Only 63 (almost 23%) companies used

Table 2: Sample companies by sectors [N=275]

Sector	Number of companies	Employment (average)	R&D personnel	R&D Expenses
			[% of total]	[% of total]
Agribusiness	3	12	8	13
Food	34	65	30	40
Consumer goods	12	45	3	16
Civil construction	2	90	8	20
Electrical and electronics	44	54	24	36
Pharmaceutics	21	170	41	39
Mechanics/transportation	65	40	7	7
Metallurgy	8	112	9	12
Mining	2	160	1	10
Furniture	4	45	1	2
Pulp and paper	3	65	4	11
Petro (chemistry)	6	210	6	27
Software	46	130	17	38
Telecommunication	9	103	14	36
Textile	11	66	11	26
Other industries	5	20	2	4
Total	275			

Source: Own research

Table 3: R&D activity, innovation and tax incentives in 2011-2014 at investigated companies [number, %]

	Company's size [N=275]						Total [Number]		Total [%]	
	Small [N=80]		Medium [N=96]		Large [N= 99]					
	yes	no	yes	no	yes	no	Yes	no	yes	No
R&D activity	5	75	27	69	51	48	83	192	30,29	69,82
Innovation	11	69	51	45	65	34	127	148	46,18	53,82
Tax incentives usage	1	79	20	76	42	57	63	212	22,91	77,09

*R&D activity in the period 2011-2014

** number of companies where innovation was implemented in the period 2011-2014

*** total number of tax incentives in the period 2011-2014

Source: Own research

R&D tax incentives in this time period. It was more popular among large companies (42 companies) than in medium and small (21 companies). We observed that among 275 in the researched sample 30,29% perform R&D activity.

knowledge and use of tax incentive vary by firm size and sectors. We use these criteria to measure the managers' awareness on tax incentives for R&D.

Table 4 shows the analysis of knowledge and tax incentives usage. Only 63 companies in the full sample are aware and use the tax incentives. Awareness is low among small businesses, and in industries with low technological intensity. Among companies who know about tax incentives all of them use it. If we consider only companies that perform R&D, the percentage increases. We find that the technological effort measured as an average of R&D spending over total sales, in general, is

RESEARCH RESULTS

Managing tax incentive knowledge

As shown in Table 4 only 83 companies (30,29% of total) conduct R&D activity, within the sampled population only 63 (22,91%) companies used the tax incentives. The

Table 4: Managers' knowledge about tax incentives for R&D

	Company size [N=275]						Total [Number]	
	Small [N=80]		Medium [N=96]		Big [N= 99]			
	Num-ber	% of total	Num-ber	% of total	Num-ber	% of total	Num-ber	%
Do not know and do not use	74	92,5	55	57,29	23	23,23	151	55,27
Know but do not use	5	6,25	21	21,88	34	34,34	61	21,82
Use	1	1,25	20	20,83	42	42,42	63	22,91
Total	80	100	96	100	99	100	275	100
Firm conducts R&D [N=83]								
Do not know and do not use	3	60	7	25,93	8	15,69	18	21,69
Know but do not use	1	20	0	0	1	1,96	2	2,41
Use	1	20	20	74,07	42	82,35	62	75,9
Total	5	100	27	100	51	100	83	100
R&D technological effort (spending over sales)								
Do not know and do not use	1,6			1		0,8		
Know but do not use	2,3			1,6		1,7		
Use	3			2,8		2,6		

Source: Own research

Table 5: Factors that may influence the level of investments in R&D* [N=62]

Factor	Number	% of Total
More government tax support types for R&D	42	66,67
Opportunity of investing more resources R&D	21	33,33
Pressure of being a technical leader	12	19,05
Higher deduction of the expenditures	50	79,37
Access to qualified R&D staff	17	26,98
Economy and political government decisions	27	42,86
General market conditions	34	53,97
Other	6	9,52

*numbers do not sum to total, because each company could choose up to 4 possible answers

Source: Own research

higher in those companies that know about tax incentives, and especially higher in those that use them.

Factors that can have influence on the level of R&D investments

The third step of our research concerned 63 companies that use R&D tax incentives. We asked respondents about factors that may have influence on their decisions connected with investments in R&D. Regarding the influence of tax incentives for R&D on the level of investments in R&D that potentially can become innovation, according to 79% of the companies who use tax incentives the government should provide higher deduction of expenditures. As we can see in Table 5 more than 66% of companies believe that implementing more than one tax relief will increase the level of investments.

The interviewed managers were quite favorable to the R&D incentive topic, particularly recognizing its relevance to increase competitiveness, especially within the domestic market. However, although they

recognize the importance of innovation, the numbers of the percentage of investments in R&D is not high (Table 3). Major concerns of companies are the acquisition of machinery and equipment, human resources training and qualification, and development of products and processes. The interaction between private companies and university and/or science and technology institutions is still very low, only 17 (26,98%) companies find it can have influence on their R&D investment level (Table 5).

The efforts and obstacles to obtain a tax incentive

The analysis of Table 6 allowed us to conclude that among the reasons listed to justify the non-use of tax incentives, the main one consists of identifying the uncertainty and bureaucracy as factors most discouraging the use of tax incentives.

The items that in the opinion of the surveyed managers should be improved are the bureaucratic obstacles to implementing R&D (80,65%). According to the managers, the problem is based on partnership

Table 6: Reasons not to use the tax incentives - the firms that “know but do not use” [N=62]

Reason	Number	% of Total
Uncertainty and business risk	42	67,74
Uncertainty of innovation identification	25	40,32
Difficulty of ensuring equipment in R&D area	30	48,39
Bureaucracy requirements	50	80,65
Tax incentive is too little as opposed labor charges	33	53,23
High turnover of staff who use incentives	24	38,71
Incentive cannot be used as it is impossible to ensure activities R&D	8	12,9
Project is partially or fully outsourced	24	38,71
Project is done internally within the company	40	64,52

*numbers do not sum to total, because each company could choose up to 4 possible answers

Source: Own research

formalization, the universities concentrate their efforts on training students and publishing, so it is difficult to get the opinion of a research institution which is necessary to use the R&D tax incentive. Managers have no knowledge of “where?”, “how to get?” and “how much does it cost?” and that seems to be the main problem in this area.

The second reason they do not use a tax incentive was uncertainty and business risk (67,74%). Managers find problems with the fact that they generally have internal R&D departments and most of their innovations are done internally (64,52%), this does not allow them to use tax incentives. Respondents often mentioned the difficulty in establishing cooperation or partnerships with universities or other STIs and suggest what is needed is to find a clearly defined and fast way to obtain the certificate of new technology from universities.

CONCLUSION

Tax incentive for new technologies is available to all companies operating in Poland which invest in new technologies, except for taxpayers filing a lump sum and commercial enterprises in special economic zones. Following legislation dates October 1 2010, PIT taxed businesses lost the ability to claim that tax relief. Small companies (PIT) lost their right to claim the relief for a few years, because there was no entities that could give an opinion about the novelty of the technology. In practice, this means that currently only taxpayers with legal status (CIT) may be eligible for the cost of spending on new technologies because there are research units that can confirm their innovation for tax purposes. Despite the fact that the same mechanism deduction applies to both CIT and PIT laws, the legislators have introduced new regulations on the financing of science pertaining only to CIT law. Despite the small popularity of this relief among PIT taxpayers, depriving them possibility of its application represents unequal treatment before the law.

Polish tax law provides tax benefits which are difficult attain by organization. We suppose the tax system for innovation doesn't consider the whole innovative cycle in a company. In order to improve the effectiveness

of innovation tax regulation tools have to be chosen according to all the innovative activity steps and not only for the beginning (scientific research and technology introduction) as it is now. Tax benefits for individuals engaged in scientific and inventive activities, in particular persons receiving patents in key areas of innovative economic development, do not exist in Poland. To promote innovation in a real business, financial resources and investment are required. Polish tax law contains the possibility to classify contributions to specially created state funds at the level of government departments as an income tax costs. It encourages the development of public-private partnership in innovation financing. Tax incentives for the formation of private partnership to finance innovation are still not provided. We consider a possible extension of tax benefits for innovation for private investors by including this investment within costs of corporate and personal income tax.

Tax benefit efficiency indicators aren't used in techniques of assessment of the country's innovative activity. The analysis of tax benefit effectiveness based on the general economic indicators led to the conclusion about their impact on innovative activity by increasing it. Nevertheless, under current reporting tax and statistical systems it is impossible to monitor and analyze tax incentives. Tax authorities are able to estimate the lawfulness of tax benefits by tax audit only. There is no information about the specific use of tax incentives for innovation in tax authorities' reports. In order to deepen the analysis of tax benefits for innovation it is advisable to provide the reporting forms for tax benefit usage. It will become possible with the development of an electronic flow of documents between tax authorities and taxpayers.

Regarding the improvement of current tax mechanism, this study has some limitations. We did not adequately explore the interrelation between universities and other R&D institutions and private companies and government. Also it is necessary to conduct comparative research with long term data for a representative sample of the EU. This study would help to understand the progress of tax incentives in the EU, and the gap of Polish incentives compared to other EU countries.

REFERENCES

- Act dated 29 July 2005 on certain forms of support for innovative activity. *Journal of Laws of 19.09.2005r.*, (No. 179, item. 1484).
- Andrews, D., Westmore, B. (2014). *Managerial Capital and Business R&D as Enablers of Productivity Convergence*. OECD Economics Department Working Papers, No. 1137, OECD Publishing.
- Badea, I., Preda, L.E., Constantinescu, A. (2009). *The Impact of the Globalization on the Evolution of Tax Systems*. *Metalurgia International*, vol. 14.
- Band, J. (2003). *The IBM Corporation*. London: Business Insights.
- Barej, E. (2009). Financial Support for Research and Development in Poland. *Oeconomica* vol. 270(55).
- Association of Business Service Leaders in Poland, (2012). Business Services Sector in Poland, Warsaw.
- Busom, I., Corchuelo, B., Martínez-Ros, E. (2014). Tax Incentives... or Subsidies for Business R&D? *Small Business Economics*, vol. 43(3), 571-596.
- De Waegenare, A., Sansing, R.C., Wielhouwer, J.L. (2012). Multinational Taxation and R&D Investments. *Accounting Review*, vol. 87(4).
- Eisenhardt, K.M., Graebner, M.E. (2007). Theory Building from Cases: Opportunities and Challenges. *Academy of Management Journal*, vol. 50, 25–32.
- Elschner, C. (2011). What the Design of an R&D Tax Incentive Tells about Its Effectiveness: a Simulation of R&D Tax Incentives in the European Union. *Journal of Technology Transfer*, vol. 36.
- Ministry of Economy, (2012). *Entrepreneurship in Poland*. Warsaw.
- EUROPE 2020. A strategy for smart, sustainable and inclusive growth, COM (2010). 2020 European Commission. Brussels: Friedrich-Ebert-Stiftung Group.
- Fowler, F.J. (2009). *Survey Research Methods*. Sage: Thousand Oaks.
- Frascati Manual, (2005). *Proposed Standard Practice for Surveys on Research and Experimental Development*. OECD.
- Graetz, M.J., Doud, R. (2000). Technological Innovation, International Competition, and the Challenges of International Income Taxation. *Columbia Law Review*, vol. 113/2.
- Hacker, B., Jakobi, A.P., Petzold, S., Pusch, T., Steinberg, P. (2010). Europe 2020 – Proposals for the Post-Lisbon Strategy: Progressive Policy Proposals for Europe's Economic, Social and Environmental Renewal. *International Policy Analysis*. Berlin: Friedrich-Ebert-Stiftung.
- Hall, B., Van Reenen, J. (2000). How Effective are Fiscal Incentives for R&D? A Review of the Evidence. *Research Policy*, vol. 29.
- Hodžić, S. (2013). Research and Development and Tax Incentives. *South East European Journal of Economics and Business*, vol. 7(2).
- http://ec.europa.eu/enterprise/policies/innovation/facts-figures-analysis/innovation-scoreboard/index_en.htm z dnia 16.04.2013r.
- Hutschenreiter, G. (2002). Tax Incentives for Research and Development. *Austrian Economic Quarterly*, vol. 2.
- Kesner-Škreb, M. (2001). Tax Incentives. *Financial Theory and Practice*, vol. 25(4).
- Klemm, A., Van Parys, S. (2012). Empirical Evidence on the Effects of Tax Incentives. *International Tax and Public Finance*, vol. 19/3.
- Kohler, C.P., Laredo, P., Rammer, C. (2012). *The Impact and Effectiveness of Fiscal Incentives for R&D*. Manchester Business School.
- Ming Ling, L., Arifin, M. Z. (2012). Small Business Enterprises and Taxation: a Case Study of Corporate Clients of a Tax Firm. *Academy of Accounting & Financial Studies Journal*, Vol.2, No. 3, 209-214.
- Moncada-Paterno-Castello, P. (2010). *New Insights on EU-US Comparison of Corporate R&D, JRC-IPTS. Working Papers on Corporate R&D and Innovation*, Institute of Prospective Technological Studies.
- Orlova, M., Khafizova, A. (2014). The Tax Component of Innovative Activity Assessment in the Russian Federation. *Life Science Journal*, vol. 11(11), 328-333.
- Deloitte, (2013). *Overview of R&D Tax Incentives in the World in 2012*. Warsaw.
- Paving the Way for a Sustainable European Prosperity Strategy, (2010). Friedrich-Ebert-Stiftung Group. International Policy Analysis.
- Popa, I., Lavric, V., Draghici, S. (2012). Tax Incentives Schemes for R&D - a Solution for the Romanian Economy. *Review of General Management*, vol. 16(2), 88-99.
- Ministry of Economy (2012). *Program of Entrepreneurship Development 2020*.
- Eurostat, (2012). *Research and Development: Annual Statistics*. Brussels.
- Deloitte, (2013). *Review of Tax Incentives in the World in 2012*. Warsaw.

- Sakata, I., Fujisue, K., Okumura, H. (2005). Do R&D and IT Tax Credits Work? Evaluation of the Japanese Tax Reform. *International Journal of Technology Management*, vol. 32/2.
- Sanchez-Gonzales, G., Herrera, L. (2010). The Influence of R&D Cooperation on Innovative Effort. *Innovation: Management, policy and practice*, vol. 12(3).
- Schumpeter, J. (1998). *The Theory of Economic Development*. Tenth printing 2004. New Brunswick, New Jersey: Transaction Publishers.
- Central Statistic Office, (2012). *Science and Technology in 2011*. Warsaw.
- Tassey, G. (2007). Tax Incentives for Innovation: Time to Restructure the R&D Tax Credit. *Journal of Technology Transfer*, vol. 32.
- Trandafir, A., Luminita, R. (2014). R&D Tax Relief in the European Union. *Economics, Management and Financial Markets*, vol. 9(1), 431-439.
- Walicka, M. (2014). Innovation Types at SMEs and External Influencing Factors. *Financial Internet Quarterly e-Finanse*, vol. 10(3), 73-81.
- Walicka, M. (2014). Tax Risks Sources and Consequences as a Part of Intercultural Management at Family Companies. *Journal of Intercultural Management*, Vol. 6, No. 4, 191-201.
- Yanadori, Y., Cui, V. (2013). Creating Incentives for Innovation? The Relationship between Pay Dispersion in R&D Groups and Firm Innovation Performance. *Strategic Management Journal*, vol. 34(12), 1502-1511.
- Yang, C.H., Huang, C.H., Hou, T.C.T. (2012). Tax Incentives and R&D Activity: Firm-level Evidence from Taiwan. *Research Policy*, vol. 41(9), 1578-1588.