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Selected aspects of indirect R&D support in the Czech Republic

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Abstract. Sustainable economic development and current global challenges accentuate businesses' innovative activities across the size spectrum. Developed countries are looking for ways to support the acceleration of R&D activities. A mix of direct and indirect instruments is used for this purpose. Indirect instruments are implemented in the corporate environment primarily through various tax incentives. A widespread form of tax incentives represents the possibility of reducing the tax base by expenses related to R&D activities. The article analyses the amount and structure of companies in the Czech Republic, which use the deduction for research and development. The research sample includes all companies that filled out their tax returns between 2009 and 2020. The established hypotheses are tested using the methods of descriptive statistics, the Chi-Square test of independence, and the analysis of variance. The research results confirm a statistically significant difference between the average number of companies using deduction for research and development if those companies are classified according to their size. In addition, it was revealed that the number

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of companies using deduction for research and development has gradually declined since 2015. Furthermore, it was found that the structure of companies using the deduction for research and development changes over time.

Keywords: indirect support, innovation, R&D tax incentives, size of companies, descriptive statistics, analysis of variance.

JEL Classification: H25, O32

1. INTRODUCTION

The development of contemporary society is very dynamic. New challenges are related to economic globalization, a fiercely competitive environment, and growing demographic, social, and environmental problems. Innovative research activities need to meet these new challenges and problems. Adopting an effective innovation strategy at both transnational and national levels is essential. This strategy must be seen comprehensively, with a broad spectrum of innovation activities directed at the economic environment, education, research, and environmental protection.

In this context, significant public and private resources support research and development in all developed countries. Various direct and indirect support instruments represent public support for R&D activities. Each country chooses the appropriate mix of these instruments to develop its innovation strategy. Direct support corresponds to the objectives set out in the innovation strategy and is mainly provided in the form of subsidies. Indirect support for R&D has the form of tax incentives provided to businesses. The professional community is widely discussing the pros and cons of both instruments and their effectiveness.

In line with EU innovation strategies, the Czech Republic spends a significant amount of funds in each budget period to achieve the objectives of the National Research, Development, and Innovation Policy (Government of the Czech Republic, 2022). The actual funding and support for R&D are realized through direct public support and indirect support in the form of tax deductions.

The instrument of indirect tax support was implemented in the Czech economic environment by an amendment to the Tax Act in 2005 (see §34 of Act No. 586/1992 Coll., on Income Taxes, as amended). The amendment should support entrepreneurial innovation activities, bring research centres of foreign companies to the Czech Republic, and, last but not least, the reason for the introduction of this tax incentive was to create a suitable alternative to the declining direct support of applied R&D from public sources (Drábková, 2017). Businesses have used this instrument quite extensively in recent years. The question is the final effect of this instrument to support R&D activities and its procedural settings in the Czech environment.

The research primarily focuses on using tax incentives for R&D activities in the Czech Republic. This incentive takes the form of a reduction in the tax base or a tax deduction for expenses related to R&D activities. This research paper aims to test the hypotheses testing the relationship between the frequency of using the R&D deductions by businesses and their size in the selected period. The analyzed data were obtained from submitted corporate income tax returns recorded in the database of the Financial Administration of the Czech Republic.

2. LITERATURE REVIEW

Innovations have long been recognized as a critical driver of social development. The recent experience with the COVID-19 pandemic confirms the importance of innovation and its ability to respond to current social and economic challenges. Innovation is always linked to the business environment and economic growth (Schumpeter, 1934). A number of authors have discussed the principle of linking businesses to

innovation and economic growth (e.g., European Commission, 2016; Belás et al., 2020; Kiselakova et al., 2018).

An essential indicator of firms' innovation activity is the amount of R&D expenditure (OECD, 2015). For various reasons for market failure (e.g., information asymmetry between innovators and investors), firms underinvest in R&D and consequently lose their innovation potential. Innovators often protect information about the innovation, and investors cannot appropriately value the intended investment (Lee, 2020). The innovation ecosystem of the whole society then falls far below its optimum. (OECD, 2015; Hall et al., 2019). Market failures are a clear argument for government intervention in the area of R&D (Griliches, 2000). Over the years, the case for public support for R&D has been growing stronger (Lundvall & Borrás, 2009; Smith, 2015), as R&D is not the concern of a particular single firm but is influenced by the maturity of a given economy and the government's priorities in this area (Petrin & Radicic, 2021; Caleb et al., 2021). In addition to that, R&D support positively influences company´s own R&D expenditures (Klímová, Žítek, & Králová, 2020). However, the offer of public support also poses some risk (Rettberg & Witt, 2021) of failure in its distribution. This can be, for example, the case of China, where companies receiving government support obtain further subsidies afterward. (Guo, Guo, & Jiang, 2022). In addition to that, Moon (2022) also states that Korean companies receiving R&D grants obtain less external financing than those companies without R&D grants. To eliminate potential risks in the management of public resources, the EU has developed a methodological toolkit for public aid (EU, 2014).

Governments use a variety of direct financial and indirect R&D support instruments to encourage investment activities in research, development, and innovation. Direct financial support can take the form of direct government funding (e.g., R&D grants, government contracts for R&D services). Direct R&D support is a discretionary and more selective form of support that allows governments to fund specific research areas with high social returns (Bronzini & Iachini, 2014). The advantage is the clarity of the subsidy scheme (the recipient of the support, the purpose, the conditions of the support, and, if applicable, the penalties resulting from failure to meet the binding parameters are known) (OECD, 2002). It makes the control mechanisms of government authorities work better (Tavares-Lehmann et al., 2016). Direct government support for R&D is particularly appropriate for large-scale scientific projects (Bernanke, 2011) and for projects that are socially useful but not market-attractive (Alexy et al., 2016). Direct support seems to be better in spurring private R&D investments than providing indirect tax incentives (Hwang et al., 2022). On the other hand, direct support is associated with the risk of inefficient use of resources or moral hazard.

In the case of indirect R&D support, the tax incentive system is widely used. It offers preferential treatment for R&D expenditure or income from R&D&I. In OECD countries, R&D tax incentives are the preferred policy instrument; they account for over 55% of total government support for R&D (OECD, 2021). An important argument for using this instrument is its versatility and wide availability (if predefined rules are met, it can be used by virtually any firm regardless of its size) (Cernikova & Hyblerova, 2021). The disadvantage is that corporate R&D goals may not always correspond with the current government innovation strategy. The effectiveness of this instrument remains a subject of debate. Tax credits reduce the revenues of public budgets. This influence should be balanced by innovation activities at the firm level and a positive impact on the country's innovation ecosystem (González Cabral et al., 2021; Kotaskova & Rozsa, 2018).).

Expenditure-based R&D tax incentives aim to encourage R&D activities by reducing the tax burden. (Sedlacek & Nemec, 2018). The design of these provisions varies considerably across countries, complicating international comparisons of the tax benefits derived from R&D tax incentives (Galindo-Rueda et al., 2018). On the other hand, differences in tax legislation across countries allow greater flexibility in selecting where to conduct R&D activities. Thus, through R&D support policies, individual countries can create a favorable innovation environment for firms and promote overall economic development.

Historically, the innovation potential has been attributed primarily to large enterprises with sufficient capital that allow carrying out R&D. On the other hand, Schumpeter's pioneering work (1934) suggests that small and medium-sized enterprises also realize innovations. Still, they have significantly less access to capital resources. Thus, there is a certain asymmetry, a market failure, which results in an unequal competitive environment in the field of R&D for SMEs. Čepel (2019). emphasizes the importance of small or micro firms in setting up the innovation system of any economy. In recent years, governments have made evident efforts to offer a range of support measures targeted at SMEs, especially young innovative companies. According to Filipová, Drozen, & Kubáňková (2016), these entities bring new products and services to the market. However, the introduction of product innovation in SMEs is also dependent on the age of the managers of a given SME (Mura, L., 2020). SMEs also introduce technological innovations and thus accelerate economic growth and meet current societal needs (Mitchell et al., 2020). Although it is evident that innovative firms are beneficial to society, there is a particular handicap to their growth associated with limited funding opportunities (Mačí & Valentová Hovorková, 2017). Banks provide financial resources to established firms in industries with solid and predictable cash flows (e.g., Berger & Udell, 1995; Stiglitz & Weiss, 1981; Petersen & Rajan, 1994). In contrast, small and innovative firms typically do not have a long history, are in the early stages of growth, and have a significant proportion of intangible assets. These attributes are disadvantageous for innovative firms and negatively impact the potential of individual actors in terms of R&D support.

Although direct support would seem to be appropriate to support the innovation potential of SMEs, recent studies (e.g., Okamuro et al., 2019) suggest that 'soft' or indirect support can be convenient for these actors. The non-discriminatory and universal use of different variants of tax offers is attractive for SMEs in particular. Tax incentives are a relatively simple and flexible R&D support policy option for many governments (Köhler et al., 2012). However, expert discussion (European Commission, 2015) shows that tax incentives target larger established R&D firms (OECD, 2013). Nevertheless, Mitchell et al. (2020) showed that the effect of R&D tax incentives is higher (or equal) in young innovative companies compared to more extended established companies.

Tax support for R&D has become one of the crucial fiscal policy instruments of the states. The architecture of R&D tax incentives is based on the maturity of the state's innovation ecosystem, the goals of the state's R&D development strategy, and the legislative setting of the whole process. This instrument is used by EU countries or the USA and by South American countries (Brazil), Asian countries (China, India), and South Africa. R&D tax incentives vary in design from one destination to another but are usually embedded in the corporate tax structure. In some countries, incentives may also apply to social insurance payments or payroll taxes. (Pfeiffer & Spengel, 2017). Usually, four concepts of tax incentives are used in developed countries to developing the R&D activities of companies (European Commission, 2015).

The first concept of R&D support takes the form of tax exemptions, deductions, or tax credits. This is the most commonly used instrument for R&D support in national tax systems. Enhanced allowances are under the R&D Tax Relief scheme. Companies can artificially increase the value of their total qualifying expenditure by a fixed percentage to generate a more significant relief. The process of artificially increasing a company's expenditure is called R&D enhancement. Or, in tax law, the 'additional deduction.' Together with accelerated depreciation, these mechanisms are also widely used. The Patent Box is a relatively newer concept that is used in 11 countries. However, recent studies (Alstadsæter et al., 2015) point out that it is a tax optimization tool rather than an R&D-enhancing mechanism (e.g., Griffith et al., 2014; European Commission, 2017).

The extent to which indirect support is used varies from country to country. Some countries use only one R&D-supporting scheme, while others implement a mix of these instruments in economic life

(European Commission, 2016). In Germany, Estonia, and Sweden, tax incentives are not used in national legislation, but their possible introduction is currently being discussed (Pfeiffer & Spengel, 2017).

Only one indirect R&D support instrument has been implemented in the Czech Republic. Enterprises carrying out innovative activities may apply a deduction from the tax base according to Section 34(4) and (5) of Act No. 586/1992 Coll., on Income Taxes. The possibility of using this deduction has been enshrined in Czech tax legislation only since 2005. Later amendments have clarified the conditions for the use of this instrument. This legislation enables the assessment of whether a particular project meets the conditions for an R&D project. In addition, it specifies the expenses that can be claimed under the deduction in connection with R&D. Furthermore, costs of services and intangible research and development results acquired by companies from public universities or research institutions were also recognized as relevant R&D expenditures. However, the element of corporate, regional, or global novelty for R&D projects is also significantly emphasized. The purpose of amending the legislation and specifying the conditions for the use of tax incentives is to increase the interest of business entities in this instrument.

3. METHODOLOGY

3.1. Description of the surveyed set of enterprises

The selected research sample aims to study the extent to which companies operating in the Czech Republic are using the deduction for research and development to optimize the amount of their corporate income taxes.

The research sample includes all companies that filled their returns between the years 2009 and 2020. The analyzed data were retrieved from the Financial Administration of the Czech Republic. The data for the period 2021 is not available because the deadline for submitting the tax return is the 30th of June 2022. The companies are classified into four categories according to their size using the number of their employees. The Commission Recommendation of the 6th of May, 2003, and the Act No. 563/1991 Coll., on Accounting define micro, small, medium-sized, and large enterprises (2003/361/E.C.) as shown in table 1.

Table 1

The criteria used for classifying companies

Criterion	Category			
	Micro	**Small**	**Medium-sized**	**Large**
Average number of employees	≤ 10	> 10	> 50	> 250
		≤ 50	≤ 250	

Source: Own elaboration according to the Commission Recommendation 2003/361/E.C. and Act No. 563/1991 Coll., on Accounting.

Table 2 shows the absolute and relative number of companies that filed their tax returns and those using the deduction for research and development. The proportion of companies using the deduction for research and development is relatively small.

Table 2

The structure of the research sample

Year	Total number of companies		Companies using the deduction	
	n_i	p_i	n_i	p_i
2009	396,925	6.91 %	655	5.41 %
2010	411,060	7.16 %	745	6.16%
2011	432,741	7.54 %	891	7.36 %
2012	454,172	7.91 %	1,029	8.50 %
2013	476,797	8.31 %	1,091	9.02 %
2014	492,276	8.58 %	1,193	9.86 %
2015	512,307	8.92 %	1,264	10.45 %
2016	531,296	9.26 %	1,230	10.16 %
2017	549,184	9.57 %	1,148	9.49%
2018	551,067	9.60 %	1,057	8.73%
2019	508,126	8.85 %	958	7.92 %
2020	424,399	7.39 %	840	6.94 %
Total	5,740,350	100.00%	12,101	100.00%

Source: Own elaboration.

3.2. Description of applied research methods

The article aims to test the statements mentioned above related to the issue of using the deduction for research and development by the companies in the Czech Republic. For that purpose, the following hypotheses are set:

H1 The average number of companies using the deduction for research and development is not dependent on their size

H2 The structure of companies using the deduction for research and development does not change over time

Firstly, the issue of the number of companies using the deduction for research and development by Czech companies is tested. The analysis of variance is used to analyze if the company's size is influencing the usage of the tax deduction mentioned. The assumptions of this method (normality of samples, agreement of variances in the samples) were verified by the chi-square goodness-of-fit test and Bartlett's test, respectively.

Subsequently, the structure of companies using the deduction for research and development is studied. For this purpose, the Chi-Square test of independence is used to analyze the structure of publishing companies. The software Stargraphics Centurion 18 was used to perform the analysis mentioned above.

4. EMPIRICAL RESULTS AND DISCUSSION

Table 3 shows the summary statistics for each group of companies classified according to their size to provide more detailed information about the analyzed companies. The statistic average and the statistics labeled as minimum, maximum, and range describe the number of companies using the deduction for research and development. The statistics are calculated for the whole period (2009-2020). The development of the number of companies using the deduction in each group in individual years is shown in figure 1. Figure 1 shows that except for the micro companies, the number of companies using the deduction rose until 2015 and then went down. This statement is consistent with the findings of Pisár, Ďurčeková & Stachová, M. (2020).

Table 3

Summary statistics describing companies using the deduction for research and development

Statistic	Category				
	Micro	**Small**	**Medium-sized**	**Large**	**Total**
Average	168.667	282.333	330.833	226.583	252.104
Standard deviation	33.557	47.487	77.161	60.692	82.501
Coefficient of variation	19.895 %	16.819 %	23.323 %	26.786 %	32.725 %
Minimum	108.000	205.000	212.000	95.000	95.000
Maximum	215.000	343.000	435.000	291.000	435.000
Range	107.000	138.000	223.000	196.000	340.000
Standard skewness	-0.412	-0.516	-0.478	-1.668	0.697
Standard kurtosis	-0.670	-0.778	-0.764	0.455	-0.631

Source: Own elaboration.

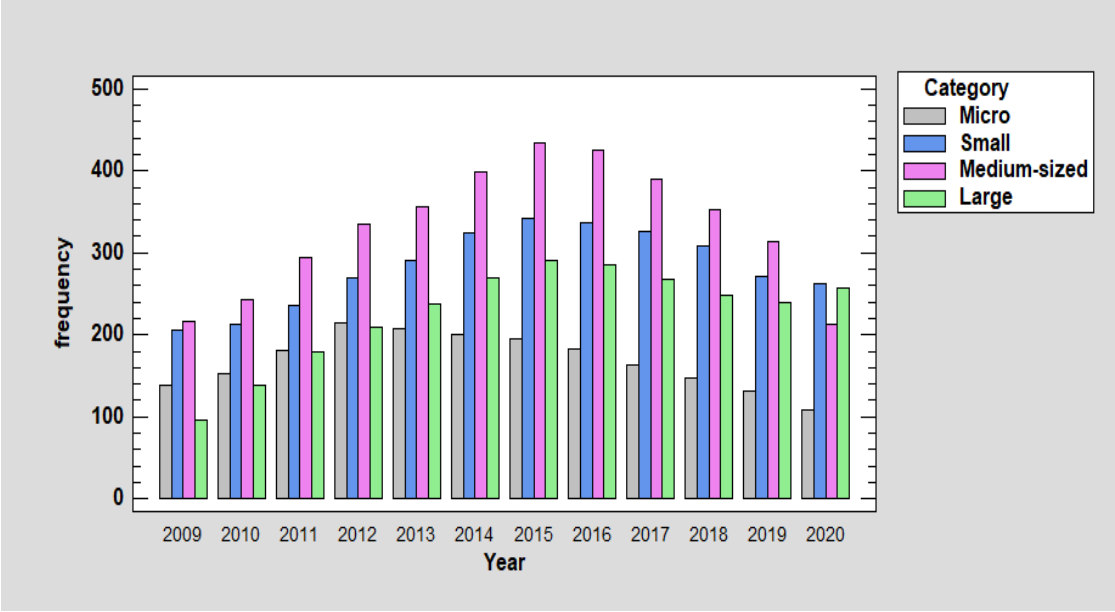

Figure 1. The number of companies using deduction for research and development.
Source: Own elaboration.

Our research verifies the findings of the Czech Statistical Office (2021), which claimed that R&D expenditures of Czech companies and the related use of deductions rose in the past. The turning point came around 2015 when the use of this instrument declined. This turnaround was probably caused by the fact that audits of the correct use of the R&D deduction found significant deficiencies in several companies. The controlling authority widely assessed the tax liability. Likely, the unclear scheme of R&D support and the strict approach of the responsible authorities have harmed businesses, and interest in using this mechanism has gradually declined. The amendment of the sub-legislative provisions in April 2019 and other interpretative methodologies (Act No. 80/2019 Coll.) should have brought a remedy. The question is whether these methodologies will be sufficiently motivating for companies in their approach to R&D activities or the use of tax incentives.

4.1. The average number of companies using the deduction for research and development

At first, the number of Czech companies using the deduction for research and development is analyzed. With the analysis of variance, it is tested if the company's size is influencing the usage of the tax deduction mentioned. Based on the results shown in table 4, there is a statistically significant difference between the average number of companies using the deduction for research and development that are classified according to their size. As the P-Value of the analysis of variance test is lower than 0.05 (see table 4), the H1 hypothesis may be rejected at the 95.0% confidence level. Figure 2 shows the difference between individual groups using Fisher's LSD uncertainty intervals.

Table 4

Results of analysis of variance

Source	*Sum of Squares*	*Df*	*Mean Square*	*F-Ratio*	*P-Value*
Between groups	176,703	3	58,900.9	18.10	0.0000
Within groups	143,202	44	3,254.59		
Total (Corr.)	319,904	47			

Source: Own elaboration.

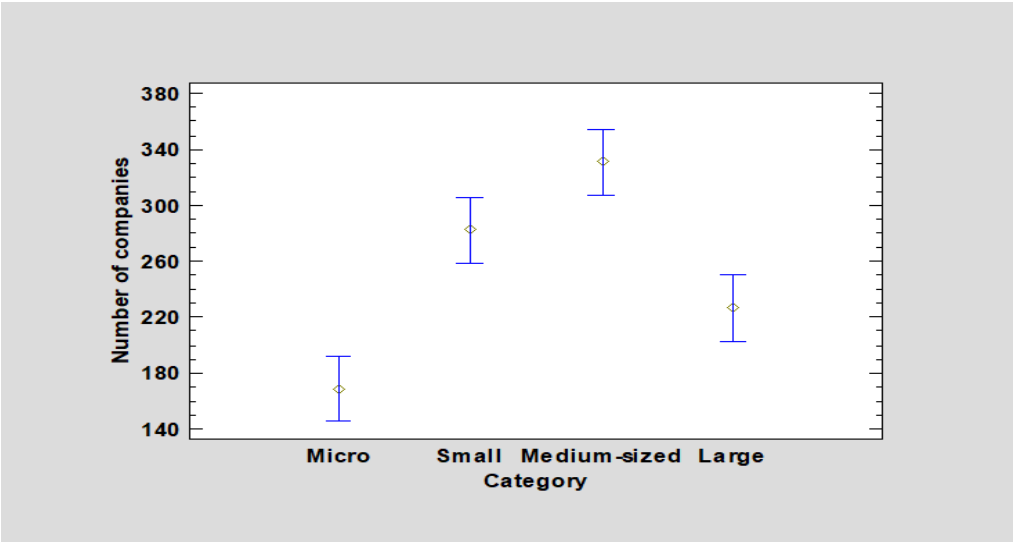

Figure 2. The means and 95% LSD intervals.
Source: Own elaboration.

In the next step, by using the multiple range tests, it was found that all of the four groups are significantly different from each other. Table 5 shows an estimated difference between each pair of means. An asterisk placed next to all six pairs indicates that these pairs show statistically significant differences at the 95,0% confidence level.

Table 5

The estimated difference between each pair of means

Contrast	*Sig.*	*Difference*	*+/- Limits*
Micro - Small	*	-113.667	46.9383
Micro - Medium-sized	*	-162.167	46.9383
Micro - Large	*	-57.9167	46.9383
Small - Medium-sized	*	-48.5	46.9383
Small - Large	*	55.75	46.9383
Medium-sized - Large	*	104.25	46.9383

Source: Own elaboration.

4.2. The structure of companies using the deduction for research and development

Subsequently, the structure of companies using the deduction for research and development in individual years is analyzed. Table 6 contains absolute and relative frequency for the four groups of companies classifying companies according to their size. Based on the independent Chi-Square test results, it can be concluded that the structure of publishing companies does change over time. As the P-Value of the Chi-Square test is lower than 0.05 (see table 7), the H2 hypothesis may be rejected at the 95.0% confidence level. The share of micro-companies is falling during the analyzed time period while the share of small companies has at first a descending tendency which changes into an ascending one from the year 2015. In the case of medium-sized companies, their share was between 32.5 and 34.5 percent, and the share of large companies rose for the whole period.

Table 6

The structure of companies using the deduction for research and development in individual years

Year	Number of companies									
	Micro		Small		Medium-sized		Large		Total	
	n_i	p_i	n_i	p_i	n_i	p_i	n_i	p_i	n_i	p_i
2009	139	21.22 %	205	31.30 %	216	32.98 %	95	14.50 %	655	5.41 %
2010	152	20.40 %	212	28.46 %	243	32.62 %	138	18.52 %	745	6.16 %
2011	181	20.31 %	236	26.49 %	294	33.00 %	180	20.20 %	891	7.36 %
2012	215	20.89 %	270	26.24 %	335	32.56 %	209	20.31 %	1029	8.50 %
2013	207	18.98 %	291	26.67 %	356	32.63 %	237	21.72 %	1091	9.02 %
2014	201	16.85 %	324	27.16 %	398	33.36 %	270	22.63 %	1193	9.86 %
2015	195	15.43 %	343	27.14 %	435	34.41 %	291	23.02 %	1264	10.45 %
2016	183	14.88 %	337	27.40 %	425	34.55 %	285	23.17 %	1230	10.16 %
2017	164	14.29 %	326	28.40 %	390	33.97 %	268	23.34 %	1148	9.49 %
2018	147	13.91 %	309	29.23 %	352	33.30 %	249	23.56 %	1057	8.73 %
2019	132	13.78 %	272	28.39 %	314	32.78 %	240	25.05 %	958	7.92 %
2020	108	12.86 %	263	31.31 %	212	25.24 %	257	30.59 %	840	6.94 %
Total	2,024	16.73 %	3,388	27.99 %	3,970	32.81 %	2,719	22.47 %	12,101	100.00 %

Source: Own elaboration.

Table 7

Test of independence

Test	Statistic	Degrees of freedom	P-Value
Chi-Square	144.664	33	0.0000

Source: Own elaboration.

The analysis shows, among other things, that only 0.1% of micro-companies claimed the R&D deduction in 2014 (the year when most micro-enterprises claimed the deduction). On the contrary, over 16% of large companies reported a deduction for R&D in 2015 (the year of the highest number). Micro-companies most often use the R&D deduction in the sectors (according to the CZ NACE division, data for 2019) 72 - science and research; 62 - IT activities, and 28 - manufacture of machinery and equipment. Large companies in 28 - manufacture of machinery and equipment; 25 - manufacture of metal structures; and 27 - manufacture of electrical equipment. The highest R&D deduction rates have long been applied in the automotive industry. On the contrary, Prokop et al. (2021) argues that in the case of manufacturing companies, support from the national budget does not significantly influence the company´s innovation performance.

The structure of companies by size in the Czech Republic does not correspond to the structure of companies claiming the R&D deduction. The micro-companies category is generally predominant among

companies in the Czech Republic. Their share has been increasing in the long term and amounts to more than three-quarters of companies. However, the share of micro-companies claiming the R&D deduction in the total number of companies claiming the R&D deduction has been declining over the long term. In 2020, the share of micro-companies among enterprises using this support form was less than 13 %. An utterly opposite trend can be observed over time in large companies whose share of companies benefiting from R&D deductions has been increasing over the long term and in 2020 was already more than 30%. In contrast, the share of large companies in the structure of companies in the Czech Republic was less than 1% in the same year. This result is consistent with the findings of Dimos et al. (2022), who also claim that tax support is more effective for manufacturing companies than high-tech ones. Similar developments to large companies can be identified for medium-sized enterprises. Among the companies using the R&D deduction, the medium-sized companies category accounts for more than a third (the values range between 33.7% and 35.5% in the monitored period); however, within the corporate structure of the Czech Republic, the medium-sized companies category accounts for only about 5% of the share.

The results for 2020 published by the Czech Statistical Office indicate that the crisis caused by the Covid -19 pandemic and the subsequent restrictive measures has also harmed corporate scientific research activities. In 2020, the amount of indirect support used in the Czech Republic fell by more than CZK 600 million. CZK 600 million (CSO, 2022). One of the few areas that saw an increase in R&D deductions claimed in 2020 was the information technology industry (CZ-NACE J-62).

The results of our research are supported by the survey conducted by the Czech Statistical Office (CSO, 2022) concludes that micro and small companies limit the use of R&D tax support and rely more often on direct forms of R&D support provided by the public sources. Furthermore, the CSO data indicate that domestic companies generally use direct R&D support from public budgets to a greater extent than indirect forms of support. On the other hand, large foreign-controlled companies have a higher interest in using R&D tax support.

In 2020, the most significant number of companies since 2007 (474 companies in total) also carried forward part of their R&D expenditure for further periods. (CSO, 2022) Companies can claim R&D expenditure as a tax deduction up to 3 years after it was incurred. Therefore, higher direct and indirect aid uptake can be expected again in the coming years due to these postponements and the expected economic recovery. Further increases in R&D spending can be expected, including indirect support in IT, healthcare, and pharmaceuticals research.

6. CONCLUSION

For the sustainable development of society and to address all current and future challenges, it is necessary to accelerate R&D and develop an effective innovation ecosystem. Business entities are an essential vehicle for innovation (Písař, P., & Bílková, D. 2019). The developed countries of the world implement a mix of instruments supporting the R&D activities of companies in the economic environment. Currently, indirect R&D support is emphasized by variously designed tax incentives and can be used by virtually all enterprises, regardless of their size.

In the Czech Republic, the tax incentive for R&D activities is constructed based on a deduction from the tax base. This instrument has been implemented in economic practice since 2005. Over the past years, the conditions for using the R&D deduction have been specified and made more concrete. The subject of the research was to analyze the use of R&D deductions by businesses of different sizes over a broader time horizon.

When studying the usage of the deduction for research and development by Czech companies, it was found that there is a statistically significant difference between the average number of companies using the

deduction for research and development that are classified according to their size. In addition, it was found out that considering the average number of companies using the deduction for research and development, all four groups of companies are significantly different from each other.

The results of this research are pretty disturbing. It is an open question whether the downward trend in the use of R&D deductions is due to stricter legislation and the potential threat of financial penalties from the supervisory authority or whether the interest of companies in R&D activities is declining. This statement could be supported by the findings of Dvorský, Petráková & Polách (2019), who claim that Czech and Slovak companies see tax issues as high or very high-intensity economic risk. The decline in the usage of R&D deductions could be quite a big problem because, according to Nilsen, Raknerud & Iancu (2020), tax credits are more effective than direct R&D support. Also alarming is the decreasing share of micro-companies using the R&D tax incentive. These companies are a relatively important part of any developed country's innovation ecosystem. The falling usage of tax incentives can lead to a decrease in sales (Walter et al., 2022) and subsequently diminish the profitability of those companies (Picas et al., 2021). Compared to the large multinational corporations, the outputs of their R&D activities will probably be applied in the country which provided the support.

In the next step, it was shown that the structure of companies using the deduction for research and development does change over time. The share of micro-companies is falling during the analyzed period to less than 13 % in 2020, while the share of small companies has at first a descending tendency which changes into an ascending one from the year 2015. In the case of medium-sized companies, their share was between 32.5 and 34.5 percent, and the share of large companies rose for the whole period and exceeded 30 % in 2020.

In order to obtain a broader picture describing the usage of the deduction for research and development by Czech companies, the analysis shall be more thoroughly focused on the difference between companies classified, for example, according to CZ NACE or provide a comparison between the structure of companies using R&D deductions and all companies registered in the Czech Republic.

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