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EDITORIAL

Vážení a milí čtenáři,

blížíme se ke konci zimního semestru akademického roku 2018/2019, ale i ke konci roku kalendářního. Tento rok nám přinesl řadu novinek. Z nich můžeme považovat za významné to, že Vysoká škola AMBIS dále pokračovala ve svém rozvoji, ne-li přímo expanzi. To umožňuje nejen nadále rozšiřovat záběr a pestrost žánrového zaměření, ale také okruh autorů a čtenářů časopisu Socioekonomické a humanitní studie.

Do obsahu se dostaly nejen články odborných přispěvatelů, ale i statě z některých vystoupení z 2. ročníku mezinárodní odborné konference z cyklu Fiskální dialog na téma Veřejné politiky napříč EU - cíle, efektivnost a dopady.

Do první skupiny odborných statí patří článek Jaroslavy Holečkové a Vojtěcha Menzla: Změna daňové neutrality efektivních daňových sazeb v ČR v letech 2010 – 2018, stejně jako článek autorek Evy Gajdošové a Aleny Maaytové: Platby za osoby pojištěné státem v českém zdravotním systému – nové výzvy a budoucí perspektivy.

Je celkem zřejmé, že vzhledem k mezinárodnímu dosahu konference Fiskální dialog budou do druhé skupiny patřit ostatní odborné statě. Zabývají se problémy, jako jsou ekonomické vazby mezi veřejným sektorem a zdravotní gramotností obyvatelstva; bariérami bránícími sociálním podnikům v zavádění inovací, anebo efektivností veřejných výdajů na výzkum a vývoj. Mezinárodnost je pak podtržena i textem zaměřeným na nová pravidla transparentnosti státní pomoci na Slovensku.

Vážení čtenáři

dovolte mi popřát Vám jménem celé redakce dobré počtení a také vše nejlepší, mnoho zdraví a úspěchů v roce 2019. Na shledanou u dalších čísel Socioekonomických a humanitních studií.

doc. Ing. František Pavelka, CSc.
šéfredaktor

Dear Readers,

We are approaching the end of the winter term of the 2018–2019 academic year as well as the end of the calendar year. This year has been full of news. In this respect, the fact that our institute, best known under the abbreviation AMBIS, a. s., has continued to develop, or even expand, is especially important. This allows us not only to increase the diversity and variety of published texts but also welcome new authors and readers of the Socio-Economic and Humanities Studies journal.

Its current issue contains not only articles by expert contributors but also papers from the 2nd edition of the conference Fiscal Dialogue, titled Public Policies across the EU – Objectives, Efficiency and Implications.

The former group of expert articles includes the following texts: Jaroslava Holečková & Vojtěch Menzl: Changes in Tax Neutrality of Effective Tax Rates in the Czech Republic in 2010–2018; and Eva Gajdošová & Alena Maaytová: Payments for State Insured Persons in the Czech Healthcare System – New Challenges and Future Perspectives.

Obviously, the latter group contains all other expert texts, also in light of the international reach of the conference Public Policies across the EU. These focus on topics including economic links between the public sector and health literacy of the public, barriers preventing social enterprises from implementing innovations, efficiency of public expenditure on R&D. The international dimension is highlighted by the publication of a text on the transparency of state aid and the new rules guiding it, using the example of Slovakia.

Dear Readers,

On behalf of the entire editorial team I wish you a pleasant reading, all the best, good health and a successful year 2019 and I am looking forward to meeting you again over the future issues of the Socio-Economic and Humanities Studies journal.

doc. Ing. František Pavelka, CSc.
Editor in Chief

CHANGES IN TAX NEUTRALITY OF EFFECTIVE TAX RATES IN THE CZECH REPUBLIC IN 2010–2018[1]

Jaroslava Holečková[2]
Vojtěch Menzl[3]

ABSTRACT

The presented paper builds on previous research in this area (Holečková, 2013) and aims to examine the tax neutrality in the Czech Republic (i.e., the extent to which the given tax leaves corporate decisions as to investments or sources of financing unchanged). A tax system that seeks to raise revenue without distortive effects is considered a neutral tax system. This aspect is of great importance as it defines one of the aims of modern tax systems and points towards one specific criterion by which they may be assessed. Our approach adopts effective tax rates on different types of capital assets and sources of financing and based on the calculation of the tax wedges it assesses the degree to which taxation affects the incentive to undertake investments in the Czech Republic. The precise methodology used to calculate effective tax rates on marginal investments is based on the approach developed by King and Fullerton (1984), whose methodology became the most widely accepted method adopted to calculate effective tax rates (tax wedges). The method appeals to both academics and practitioners to this day (e.g., Florio, 2007). The tax wedge will vary according to the type of asset: machinery, buildings, inventory (because of different capital allowance rates relative to the assumed true economic depreciation rates) and the type of financing sources: new equity, debt and retained earnings (since the tax treatment of debt, dividends and retained earnings differs). Effective tax rates take into account not only the statutory corporate tax rate, but also other aspects of the tax system which determi-

[1] This paper has been elaborated as one of the outcomes of the research project of the Faculty of Finance and Accounting in the framework of the Institutional support of the University of Economics, Prague, under Reg. No. IP 100040.

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ne the amount of taxes paid and profitability of investment, including personal taxes. The paper finds out that, based on the calculations for 2018, businesses need to ensure the rate of return higher by 1.33 percentage points for the retained earnings (and by 1.80 percentage points for new equity, respectively) compared to the final post-tax rate of return which investors actually get. The adopted analysis suggests that Czech tax system tends to favour investments in machinery on the expense of buildings and, particularly, inventories. With this respect, our results correspond to outcomes of other, similar country-specific studies, such as, for example, de Almeida–Paes (2013). The tax system also lacks neutrality when considering alternative sources of finance, i.e., the debt finance tends to be favoured over equity and retained earnings.

Key words: *effective tax rates, tax wedges, tax neutrality, type of asset, type of finance sources, taxable profit.*

JEL classification: H210

1 INTRODUCTION

Profit taxes adopted by the developed market economies distort the types of investments which companies undertake, i.e., the way they finance those investments and the overall level of investment. All these issues get worse the higher the level of inflation because no corporate tax system adjusts fully for the effects of inflation (Heady–Pearson–Rajah–Smith, 1993, p. 35). However, inflation, important as it may be, is only one issue. Other features of the corporate tax system, particularly its effects on corporate decisions as to the undertaken investments and sources of finance, matter as well and at any inflation rate (King–Wookey, 1987, p. 6).

The tax system that seeks to raise revenue in ways that avoid distortionary substitution effects regarding decisions on investments or sources of finance is considered a tax neutral one. This does not imply that the tax system has no impact upon behaviour but instead suggests that high marginal tax rates should be avoided and there should not be different tax rates on essentially similar activities (Heady–Pearson–Rajah–Smith, 1993, p. 25).

The goal is tax neutrality; that is, to a tax that leaves corporate decisions regarding investments or sources of financing unchanged (King–Wookey, 1987, p. 7).

Taxes impose a real cost to the economy inasmuch as they create distortions to the market allocation of resources. However, not all tax systems are equally distortive, and one obviously attractive objective is to minimise the impact of the tax structure on behaviour as far as possible. A corporate tax that achieves this

with regard to decisions on investments or sources of financing is described as the neutral tax (King–Wookey, 1987, p. 13).

Suppose there were no corporate taxes, and consider a company appraising an investment project. The company will assess the returns earned on the project after rewarding its suppliers of capital with the required return. To make a profit, the project has to generate at least this return for the company. Now we can measure the effect of introducing a corporate tax in terms of such an investment decision. For it may be that the corporate tax raises the pre-tax required return the project needs to earn for the company to be worthwhile above of what was needed in the absence of any corporate tax. If it does this, the tax drives a "wedge" between the pre-tax return and the post-tax required rate of return, and will have a disincentive effect on the corporate investment. In other words, it will not be neutral. For a fully neutral tax, this wedge will be zero (King–Wookey, 1987, p. 7).

The difference between the pre-corporate tax rate of return earned by companies and the post-tax receipts an individual gets is the measure of the total distortion (the total tax "wedge") caused by taxes. The size of the "wedge" can be a rather accurate indication of the degree of neutrality in the corporate tax system. The tax wedge provides an extremely useful tool to investigate this aspect of different tax regimes, and it is used in the empirical analysis of this paper. The tax wedge also represents one of the forms of how to calculate effective tax rates.

Effective tax rates are tax rates which take into account not only the statutory corporate tax rate, but also other aspects of the tax system which determine the amount of the tax paid and the profitability of an investment, such as capital allowances and stock relief. Effective tax rates may also require a consideration of personal taxes and the manner (if any) in which the corporate and personal tax systems are integrated (classical, split-rate or imputation). Inflation will also alter effective tax rates in various ways, depending on how the given tax system calculates taxable profits in the presence of inflation.

Effective tax rates (rather than statutory tax rates) can give us an idea of the level of distortion imposed on investments by the tax system. Therefore, it makes sense to consider the effective taxation of different types of capital assets and sources of financing when evaluating the distortedness of the tax system. Statutory tax rates measure the tax burden as imposed by the government on the

specified income (or expenditure) streams. These statutory tax rates do not take into account depreciation or other deductions, nor do they consider the effects of inflation on the actual amount of tax paid relative to the value of the income stream. Effective tax rates are designed to correct for these facts.

As noted above, there are various factors that are of essential significance using the idea of the tax wedge:

- statutory corporate tax rate
- system of depreciation and its rates
- capital structure
- system of personal taxation
- manner of the corporate and personal tax systems integration
- rate of inflation
- capital allowances

There are in total three rates of return that are useful to focus on when discussing effects of the tax system on investments decisions:

- Real pre-corporate tax rate of return to companies (p),
- Real interest rate, which is the return that can be earned on a government bond or a bank deposit before personal taxes are charged (r – usually 5%, reflecting the typical real interest rate) and
- Real post-personal tax rate of return received by the ultimate financiers of the investment (s).

The relation between the nominal interest rate (i) and the post-tax real return (s) can be simply stated:

$$s = \frac{1 + i\,(1 - ti)}{1 + \pi} - 1, \tag{1}$$

where:

π is the rate of inflation,

i is the nominal interest rate, equal to $(1+ r)\cdot(1+\pi) - 1$, and

t_i is the personal tax rate on interest income.

Given the specified relationships between the pre-corporate tax return (p), the interest rate (r), and the post-personal tax return (s), various effective tax rates or wedges can be calculated (on capital assets – such as machinery, buildings, inventories, or sources of financing – e.g. new equity, retained earnings, debt). The difference between p (the pre-tax rate of return to companies) and s (the post-tax rate of return to individuals) reflects the overall size of the market distortion caused by corporate and personal taxes.

There are three relevant measures of effective tax rates on businesses:

1. First, it is the (p) which is required to get the particular value of (r),
2. Second, it is the tax wedge – the percentage difference between (p) and (s),
3. Third, it is the tax rate – the tax wedge (p–s) divided by (p). The tax rate as such is not always a particularly useful figure, since the tax wedge may be similar in two different cases, but (p) may vary, giving substantial differences in the tax rate.

The main objective of the King–Fullerton approach is to derive the difference between the pre-tax and post-tax real rate of return required from an investment project. In the absence of the corporate tax, these will, of course, be equal to each other and also equal, by assumption, to the prevailing real interest rate (r). However, corporate taxes may cause the pre-tax required real rate of return, also termed the cost of capital, (p), to diverge from the interest rate. In addition, personal taxes may reduce the post-tax real return to the individual investor (s) below the interest rate.

The methodology and calculations of tax wedges include the corporate tax rate, depreciation allowances, valuation of dividends, personal tax rates on the dividend income, interest income and capital gains, and the rate of inflation.

Three forms of financing the company are considered:

– Retained earnings (RE)
– New equity (NE)
– Debt (borrowings) (D)

Investments in three assets that are distinguished in the balance sheet:

– Machinery (M)

– Buildings (B)
– Inventory (I)

The precise methodology used to calculate effective tax rates on investments in this paper is closely based on the approach developed by King and Fullerton (1984), which allows modelling complicated provisions of the tax codes in a rigorous manner.

2 ANALYSIS OF THE TAX NEUTRALITY THROUGH TAX WEDGES IN THE CZECH REPUBLIC

As noted above, there are various factors of essential significance when using the idea of the tax wedge.

Assumptions and parameters used in the calculation:

Sector	Manufacturing
Sources of finance	Retained earnings (RE), new equity (NE), debt (D)
Types of asset	Machinery (M), buildings (B), inventories (I)
The weights[4] used for finance	55% RE, 10% NE, 35% D
The weights for assets	50% M, 28% B, 22% I
Length of life for tax purposes	Machinery 6 years (tax rate 16.67%), buildings 30 years (tax rate 3.33%)
Economic depreciation rate	Machinery 12.3%, buildings 3.6%
Inventories	Assumed not to be depreciated
The real interest rate	5%
The inflation rate	1.5% in 2010, 2.3% in 2018 (expected)
Personal tax rates of individual investors	Rate on interest (t_i = 15%), rate on dividends (t_d = 15%), rate on capital gains (z = 15%)
Statutory corporate tax rate t	19% in both years (no change)

[4] Weights for the sources of finance by OECD (1991) and Clark (2010, online version, p.4), respectively.

Factor	Year 2010	Year 2018
Inflation	1.5%	2.3%
Tax rate on capital gains	15%	15%
Tax rate on dividends	15%	15%
Corporate tax rate	19%	19%
Number of year for machinery depreciations	6 years	6 years
Number of years for building depreciations	30 years	30 years

We may distinguish seven main steps in calculating the tax wedges as listed within separate subheadings below.

2.1 NOMINAL RATE OF INTEREST

Nominal rate of interest [i] is given by the following formula:

$$i = (1 + r)\cdot(1 + \pi) - 1$$
$$\text{i} = (1 + 0.05)\cdot(1 + 0.015) - 1 = (1.05 \cdot 1.015) - 1 = 0.0657 \quad (2)$$

i = nominal interest rate,
r = real interest rate (5%, i.e. 0.05),
π = inflation rate.

2.2 DISCOUNT RATE OF INDIVIDUAL TYPES OF FINANCE

The discount rate for each type of finance [p'] is calculated as follows.

(a) Retained earnings:

$$p'_{RE} = \frac{(1 - ti)\cdot i - z \cdot \pi}{1 - z} \quad (3)$$

t_i = tax rate on interest,
t_d = tax rate on dividends,
z = tax rate on capital gains.

The capital gains tax rate Z is the accrual equivalent rate applied to the nominal capital gain. To calculate this rate, it is necessary to make some assumptions regarding the time at which the shareholder sells his or her shares, realises the gain and hence faces the tax liability. The approach of King (1997) is followed in assuming that the shareholder sells a constant proportion α of his or her stock of assets in each period, normally taken to be 10 %. In this case, the accrual equivalent capital gain tax rate is simply the present value of taxes due on the capital gain of one period t, that is:

$$z = \frac{\alpha \cdot z_r \cdot (1 + j)}{\alpha + j} \tag{4}$$

$j = i \cdot (1 - t_i)$, i.e. shareholders' discount rate,
z_r = statutory tax rate on capital gains after sale,
α = proportion of stock of assets realised each year.

$$z = \frac{0.015 \cdot (1 + 0.0657 \cdot 0.85)}{0.1 + (0.0657 \cdot 0.85)} = \frac{0.0158}{0.1559} = 0.1016$$

$$p'_{RE} = \frac{(1 - 0.15) \cdot 0.0657 - 0.1016 \cdot 0.015}{1 - 0.1016} = 0.0605$$

(b) New equity:

$$p'_{NE} = \frac{(1 - t_i) \cdot i - z \cdot \pi}{1 - t_d} \tag{5}$$

$$p'_{NE} = \frac{(1 - 0.15) \cdot 0.0657 - 0.1016 \cdot 0.015}{1 - 0.15} = 0.0640$$

(c) Debt:

$$p'_D = (1 - t) \cdot i \tag{6}$$

t = corporate tax rate.

2.3 PRESENT VALUE OF DEPRECIATION ALLOWANCES

The formula for calculation of the present value of depreciation allowances [A] can be used for declining balance and straight line (linear) depreciation schedules.

For the straight line schedule it is as follows:

$$A_S = \frac{o \cdot t \cdot (1 + p')}{p'} \cdot \left[1 - \frac{1}{(1 + p')^N} \right] \tag{7}$$

N = number of years for ($N = 1 / o$),
o = tax depreciation rate,
o_m = 0.1667 for machinery (in the CR),
o_b = 0.033 for buildings (in the CR),
p' = discount rate for each type of finance,
t = corporate tax rate.

For the declining balance schedule it is as follows:

$$A_D = \frac{o \cdot t \cdot (1 + p')}{p' + o} \tag{8}$$

In this calculation, the straight (linear) schedule (prevailing in the Czech Republic) will be considered according the Formula (6).

It must be calculated for each class of machinery and building (inventories do not receive any allowance). In each case, the present value depends on the company's discount rate, which, as we have seen in step 2, in turn depends on the source of finance.

The present value of depreciation for **machinery**:

There are three possible values of the discount rate p' corresponding to the values given above. We take each in turn:

$$A_{M,\,RE} = \frac{0.1667 \cdot 0.19 \cdot (1 + 0.0605)}{0.0605} \cdot (1 - \frac{1}{1.0605^6} =$$
$$= 0.5550 \cdot 0.2971 = 0.1649$$

$$A_{M,\,NE} = \frac{0.1667 \cdot 0.19 \cdot (1 + 0.0640)}{0.0640} \cdot (1 - \frac{1}{1.0640^6} =$$
$$= 0.5268 \cdot 0.3106 = 0.1636$$

$$A_{M,\,D} = \frac{0.1667 \cdot 0.19 \cdot (1 + 0.0533)}{0.0533} \cdot (1 - \frac{1}{1.0533^6} =$$
$$= 0.6262 \cdot 0.2675 = 0.1675$$

The present value of depreciation for **buildings**:

Buildings are depreciated over 30 years. Using (7) we again need to take each of the sources of financing in turn:

$$A_{B,\,RE} = \frac{0.0333 \cdot 0.19 \cdot (1 + 0.0605)}{0.0605} \cdot (1 - \frac{1}{1.0605^6} =$$
$$= 0.1110 \cdot 0.8284 = 0.0919$$

$$A_{B,\,NE} = \frac{0.0333 \cdot 0.19 \cdot (1 + 0.0640)}{0.0640} \cdot (1 - \frac{1}{1.0640^6} =$$
$$= 0.1054 \cdot 0.844 = 0.0889$$

$$A_{B,\,D} = \frac{0.0333 \cdot 0.19 \cdot (1 + 0.0533)}{0.0533} \cdot (1 - \frac{1}{1.0533^6} =$$
$$= 0.1252 \cdot 0.7891 = 0.0988$$

Thus, in each case the present value of depreciation allowances rises as the discount rate falls, since the future allowances are not discounted so heavily.

Except for the rate of depreciation, the present value of depreciation allowances depends also on:

1) The discount rate of the company for the particular type of financing,

2) The source of financing.

Since inventories are not depreciated, their present value is not calculated.

2.4 REQUIRED REAL PRE-TAX RATE OF RETURN (P)

There are altogether nine individual required real rates of return [p] to be calculated, corresponding to an investment in the three assets, each funded from one of the three sources of financing. Again, we consider these in turn.

This step requires introduction of four additional parameters that were not yet considered: the economic depreciation rate *d* for machinery, buildings and inventories, which are assumed to be 12.25% (i.e., 0.1225) and 3.61% (i.e., 0.0361) and zero, respectively, and the proportion of inventories valued using the FIFO method v, which in the Czech Republic is nearly 100% (i.e., 1.0). The LIFO method is not allowed.

The calculation for machinery and buildings uses the following formula:

$$p = \frac{1 - A \cdot i}{(1 - t) \cdot (1 + \pi)} \cdot [p' - \pi + d \cdot (1 + \pi)] - d \qquad (9)$$

d_m = 0.1225 for machinery,
d_b = 0.0361 for buildings.

The formula for inventories is as follows: (10)

$$p = \frac{1 - A \cdot i}{(1 - t) \cdot (1 + \pi)} \cdot [p' - \pi + d \cdot (1 + \pi)] + \frac{v \cdot t \cdot \pi}{(1 - t) \cdot (1 + \pi)} - d$$

The expression (10) shows the calculation for the cost of capital when the inflationary increase in the value of inventories is taxed. With v=1, calculations are therefore as follows: if the inflation rate is high, then it implies an increase in the tax wedge for inventories.

Now we can calculate the real required pre-tax rate of return (p) that also represents the cost of capital.

Machinery (according to Formula 9)

Retained earnings:

$$p_{M,RE} = \frac{1 - 0.1649}{(1 - 0.19) \cdot (1 + 0.015)} \cdot [0.0605 - 0.015 + 0.1225 \cdot$$

$$\cdot (1 + 0.015)] - 0.1225 = 0.0500 = 5.00\%$$

New equity:

$$p_{M,NE} = \frac{1 - 0.1636}{(1 - 0.19) \cdot (1 + 0.015)} \cdot [0.0640 - 0.015 + 0.1225 \cdot$$

$$\cdot (1 + 0.015)] - 0.1225 = 0.0538 = 5.38\%$$

Debt:

$$p_{M,D} = \frac{1 - 0.1675}{(1 - 0.19) \cdot (1 + 0.015)} \cdot [0.0533 - 0.015 + 0.1225 \cdot$$

$$\cdot (1 + 0.015)] - 0.1225 = 0.1225 = 4.21\%$$

Buildings (according to Formula 9)

Retained earnings:

$$p_{B,\,RE} = \frac{1 - 0.0919}{(1 - 0.19) \cdot (1 + 0.015)} \cdot [0.0605 - 0.015 + 0.0361 \cdot$$

$$\cdot (1 + 0.015)] - 0.0361 = 0.0546 = 5.46\%$$

New equity:

$$p_{B,\,NE} = \frac{1 - 0.0890}{(1 - 0.19) \cdot (1 + 0.015)} \cdot [0.0640 - 0.015 + 0.0361 \cdot$$

$$\cdot (1 + 0.015)] - 0.0361 = 0.0588 = 5.88\%$$

Debt:

$$p_{B,D} = \frac{1 - 0.0988}{(1 - 0.19) \cdot (1 + 0.015)} \cdot [0.0533 - 0.015 + 0.0361 \cdot$$

$$\cdot (1 + 0.015)] - 0.0361 = 0.0460 = 4.60\%$$

Inventories (according to Formula 10)

Retained earnings:

$$p_{I,RE} = \frac{1 - 0}{(1 - 0.19) \cdot (1 + 0.015)} \cdot [0.0605 - 0.015 + 0 \cdot (1 + 0.015)] +$$

$$+ \frac{1 \cdot 0.19 \cdot 0.015}{(1 - 0.19) \cdot (1 + 0.015)} - 0 = 0.0588 = 5.88\%$$

New equity:

$$p_{I,NE} = \frac{1 - 0}{(1 - 0.19) \cdot (1 + 0.015)} \cdot [0.0640 - 0.015 + 0 \cdot (1 + 0.015)] +$$

$$+ \frac{1 \cdot 0.19 \cdot 0.015}{(1 - 0.19) \cdot (1 + 0.015)} - 0 = 0.0630 = 6.30\%$$

Debt:

$$p_{I,D} = \frac{1 - 0}{(1 - 0.19) \cdot (1 + 0.015)} \cdot [0.0533 - 0.015 + 0 \cdot (1 + 0.015)] +$$

$$+ \frac{1 \cdot 0.19 \cdot 0.015}{(1 - 0.19) \cdot (1 + 0.015)} - 0 = 0.0500 = 5.00\%$$

2.5 POST-TAX RETURN TO INVESTORS

Next, we calculate the post-tax return to investors [s]

$$s = \frac{1 + i \cdot (1 - t_i)}{1 + \pi} - 1 \tag{11}$$

$$s = \frac{1 + 0.06575 \cdot (1 - 0.15)}{1 + 0.015} - 1 = 4.03\%$$

2.6 AVERAGE REQUIRED REAL PRE-TAX RATES OF RETURN

Step 4 yielded nine different values of the cost of capital. These are combined into weighted averages [p] (see Table 1). Weights for the individual asset types are 50% for machinery, 28% for buildings and 22% for inventories. The weights for sources of financing are 55% for retained earnings, 10% for new equity and 35% for debt. These weights yield in the following table:

Tab. 1 » Weights yield

P	RE	NE	D	Weighted average
Buildings (B)	5.46%	5.88%	4.60%	5.20%
Machinery (M)	5.00%	5.38%	4.21%	4.76%
Inventory (I)	5.88%	6.30%	5.00%	5.62%
Weighted average	5.33%	5.72%	4.49%	

2.7 WEIGHTED AVERAGE TAX WEDGE

The weighted average tax wedge is calculated as $[p - s]$, $s = 4.03\%$.

Tab. 2 » Weighted average tax wedge for 2010

Wedges (p-s)	RE	NE	D	Weighted average
Buildings (B)	1.44%	1.85%	0.57%	1.17%
Machinery (M)	0.97%	1.35%	0.19%	0.74%
Inventory (I)	1.85%	2.27%	0.97%	1.59%
Weighted average	1.30%	1.69%	0.47%	**1.05%**

Note: Model with calculations in Annex 2.

Tab. 3 » Weighted average tax wedge for 2018

Wedges (p-s)	RE	NE	D	Weighted average
Buildings (B)	1.44%	1.93%	0.58%	1.19%
Machinery (M)	0.99%	1.44%	0.20%	0.76%
Inventory (I)	1.97%	2.47%	1.09%	1.71%
Weighted average	1.33%	1.80%	0.50%	**1.09%**

Note: Model with calculations in Annex 3.

3 RESULTS, DISCUSSION AND CONCLUSIONS

Calculation has been done for the years 2010 and 2018. When comparing the values of tax wedges in 2018 with the values calculated for 2010 as indicated in the tables above, we can interpret the results.

The values of the tax wedges for 2018 in Table 3 can be interpreted as follows: e.g., line 2 shows that a company which needs to guarantee an investment into machinery financed from the combination of retained earnings, new shares and borrowings (debt), must ensure the rate of return 0.76 percentage points higher than the investor really receives after taxation, in 2010 it was 0.74 percentage points – a slightly negative change. The difference will be paid to the government in the form of taxes. Tax wedge in buildings and other constructions has also risen in 2018 (from 1.17 percentage points in 2010 to 1.19 percentage points in 2018).

If we look at the sources of financing, we can see that combined investment into machinery, buildings and stocks is taxed in the case of financing from both retained earnings and new equity. The difference between these two methods shows that in 2018, a company has to ensure the rate of return which is higher by 1.33 percentage points for retained earnings, resp. 1.80 percentage points for new equity, than the final post-tax rate that the investor actually gets. The analysis in this paper suggests that Czech tax system tends to favour investment in machinery over buildings and, particularly, over inventories. With this respect, our results correspond to outcomes of other, similar country-specific studies, such as, for example, de Almeida–Paes (2013), who conclude that in the case of Brazil, machinery and buildings receive a better tax treatment than inventories.

The tax system is also not neutral with regard to alternative sources of corporate finance. The data indicate that debt finance tends to be favoured over equity and retained earnings.

On average, the total rate of return (total tax wedge) of a company before taxation is 1.09 percentage points higher than the rate of return after tax actually received by the investor. This total tax wedge is much lower than the OECD average, which is 2.4 resp. 2.1 (OECD, 1991). Even partial tax wedges are similar to the values in OECD countries. They are even lower in some cases. Shortening the depreciation period has got a major influence on lowering the tax wedge within the category of machinery and buildings.

When comparing the values from 2018 and 2010, we can see a slight worsening in the calculated values (an increase both in the values of partial tax wedges and the total average from 1.05 to 1.09 percentage points). This negative change has been mainly caused by the increase in inflation from 1.5 % in 2010 to 2.3 % in 2018 (projection by the Czech Statistical Office).

REFERENCES

CLARK, S., 2010. *Assessing the foreign direct investment response to tax reform and tax planning. Globalization and its tax discontents: Tax policy and international investments*; Essays in honour of Alex Easson. Toronto: University of Toronto Press, ISBN 0802099769. Pp. 84–114. Available online at http://www.oecd.org/ctp/tax-policy/39975841.pdf

CNOSSEN, S., 1993. *What Kind of Corporation Tax?* Bulletin for International Fiscal Documentation, Amsterdam, vol. 47.

DE ALMEIDA, F., Paes, N. (2013). *The influence of interest on net equity and interest rates on tax neutrality – a case study of the Brazilian corporate taxation.* EconomiA, Vol. 14, Issues 3–4, September–December 2013, pp. 185–198. doi.org/10.1016/j.econ.2013.10.004.

FLORIO, M., 2007. *Investment and Neutrality of Capital Income Taxation: Testing the King-Fullerton Framework.* SSRN Electronic Journal. Available at: http://dx.doi.org/10.2139/ssrn.3202104

HEADY, C., PEARSON, M., RAJAH, N., SMITH, S., 1993. *Report on the Czechoslovakian Government´s Tax Proposal.* London, Institute for Fiscal Studies 1993.

HOLEČKOVÁ, J., 2013. *Comparison of the Tax Neutrality by Means of the Effective Tax Rates in the Czech Republic in the years 2000–2010*. 1st Annual International Interdisciplinary Conference Egalite Macedonia 2013, Vol. 1, pp. 344–355, ISBN 978-608-4642-03-9.

HULTEN, C., WYKOFF, F., 1981. *The Measurement of Economic Depreciation.* In: Hutten, C. (ed.): Depreciation, Inflation and the Taxation of Income from Capital. Washington, D.C., Urban Institute.

KING, J., WOOKEY, C. 1987. *Inflation: The Achilles´ Heel of Corporation Tax.* Report Series No. 26. London, Institute for Fiscal Studies.

KING, M., FULLERTOn, D., 1984. *The Taxation of Income from Capital: A Comparative Study of the US, UK, Sweden and West Germany*. Chicago, Chicago University Press, 1984.

MAREK, P., RADOVÁ, J., 2002. *Skutečný okamžik realizace daňové úspory*. (Real Moment of Tax Shield Realisation). Acta Oeconomica Pragensia, 2002, vol. 10, no. 1, pp. 104–116.

NORR, M., 1992. *The Taxation of Corporations and Shareholders.* Deventer, Kluwer Law and Taxation Publishers, 1992.

SHARPE, W., ALEXANDER, G., 1994. *Investice.* Praha, Victoria Publishing, 1994.

OECD, 1991. *Taxing Profits in a Global Economy – Domestic and International Issues*. Paris, OECD, 1991.

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ANNEX 1

Assumptions and variables of the model		2010	2018
Real interest rate	R	5%	5%
Inflation	π	1.5%	2.3%
Tax rate on interest	ti	15%	15%
Tax rate on dividends	td	15%	15%
Tax rate on capital gains	zr	15%	15%
Corporate tax rate	t	19%	19%
Alpha	α	10%	10%
Tax depreciation rate on buildings	ob	3.33%	3.33%
Tax depreciation rate on machinery	om	16.67%	16.67%
Proportion on inventories valued by FIFO	v	100.0%	100.0%
Economic depreciation rate on buildings	db	3.61%	3.61%
Economic depreciation rate on machinery	dm	12.25%	12.25%
Weight for retained earnings	RE	55%	55%
Weight for new equity	NE	10%	10%
Weight for debt	D	35%	35%
Weight for buildings	B	28%	28%
Weight for machinery	M	50%	50%
Weight for inventories	I	22%	22%
Derived assumptions		2010	2018
Nominal interest rate	i	7%	7%
Shareholders' discount rate	j	6%	6%
Length of depreciation of buildings (years)	Nb	30	30
Length of depreciation of machinery (years)	Nm	6	6
Required post-tax return to investors	s	4.03%	3.91%

ANNEX 2

TAX WEDGES 2010

Discount rates

p'	RE	NE	D
p' (B, M, I)	0.0605	0.0640	0.0533

Present value of depreciation allowances

A	RE	NE	D
Buildings (B)	0.0919	0.0890	0.0988
Machinery (M)	0.1649	0.1636	0.1675

Required pre-tax rate of return

P	RE	NE	D	Weighted average
Buildings (B)	5.46%	5.88%	4.60%	5.20%
Machinery (M)	5.00%	5.38%	4.21%	4.76%
Inventory (I)	5.88%	6.30%	5.00%	5.62%
Weighted average	5.33%	5.72%	4.49%	

Tax wedges

Wedges (p-s)	RE	NE	D	Weighted average
Buildings (B)	1.44%	1.85%	0.57%	1.17%
Machinery (M)	0.97%	1.35%	0.19%	0.74%
Inventory (I)	1.85%	2.27%	0.97%	1.59%
Weighted average	1.30%	1.69%	0.47%	**1.05%**

ANNEX 3

TAX WEDGES 2018

Discount rates

p'	RE	NE	D
p' (B, M, I)	0.0674	0.0715	0.0601

Present value of depreciation allowances

A	RE	NE	D
Buildings (B)	0.0862	0.0830	0.0924
Machinery (M)	0.1624	0.1610	0.1650

Required pre-tax rate of return

P	RE	NE	D	Weighted average
Buildings (B)	5.36%	5.84%	4.49%	5.10%
Machinery (M)	4.90%	5.35%	4.11%	4.67%
Inventory (I)	5.88%	6.38%	5.00%	5.62%
Weighted average	5.24%	5.72%	4.41%	

Tax wedges

Wedges (p-s)	RE	NE	D	Weighted average
Buildings (B)	1.44%	1.93%	0.58%	1.19%
Machinery (M)	0.99%	1.44%	0.20%	0.76%
Inventory (I)	1.97%	2.47%	1.09%	1.71%
Weighted average	1.33%	1.80%	0.50%	**1.09%**

PAYMENTS FOR STATE INSURED PERSONS IN THE CZECH HEALTHCARE SYSTEM - NEW CHALLENGES AND FUTURE PERSPECTIVES[1]

Eva Gajdošová
Alena Maaytová

ABSTRACT

The paper highlights the importance of payments for state insured persons in the Czech Republic financial and healthcare system, and subsequently, structural components are described. This is a very current issue, as payment is defined only until the year 2020 and the situation after that date remains unclear. The article deals with four possible approaches to the determination of the payments, i.e. how the assessment base for these payments might change in the year 2021. Based on these scenarios and demographical projections, development of this payment is calculated until the year 2030. It can be concluded that the development of the payment will on the one hand depend on the available resources of the state budget and on the other hand on the needs of the healthcare system.

Keywords: *ageing, healthcare, public expenditures, sustainability, health insurance.*

JEL Classification: I10, H51

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INTRODUCTION

Today, financing of the healthcare system poses a problem for almost every developed country due to its many consequences and the complexity of the system. The system undoubtedly affects functioning of a national economy as described in the crucial publication, "National Strategy Health 2020", issued by the Czech Ministry of Health (MoH, 2014). An individual's health status can be determined by genetics, lifestyle, education, healthcare, wealth, environment and other aspects. On the other hand, the health of the population influences a national economy's productivity, labour supply, education, capital formation and rate of savings and investments (European Commission, 2005). The relevant question is the proportion of the above mentioned factors. Based on the literature we know that the major factor is lifestyle (50 %), followed by the environment (20 %), genetics (15 %) and healthcare system (15 %) (Drbal, 2005; Maaytová, 2012). Also social determinants including income, employment, education (Janečková, Hnilicová, 2012) should not be neglected. It is clear that the healthcare system has a limited influence on human health, but its importance cannot be denied if we want to achieve economic objectives.

Healthcare comes first and foremost when it comes to the impact of ageing on public finances. In this context the issue of increasing life expectancy is often mentioned as it results in a longer use of healthcare services and a wider use of these services, especially in old age, because of more complex diseases (Heady, 2015), (Mertl, 2014). The absolute public spending on healthcare is growing steadily. Scientific sources define a number of other causes of this growth, along with the above mentioned ageing of the population they include: expansion of new technological approaches, income effect, Baumol's cost disease, various institutional characteristics and the level of health services' centralization (Chernew, Newhouse, 2011; Martín at al., 2011; Oxley, Morgan, 2009).

Politicians have to manage the opportunities on the revenue side to meet the increasing demand on the expenditure side of the system. Public finances significantly influence healthcare financing in many countries, and they especially contribute to the reimbursement of healthcare to people who are unable to pay for it themselves due to their social situation, age, health status etc. The financing generally relies on a high level of solidarity because there is no link between contribu-

tions and the consumption of services. There are two main groups of typologies of the public financing schemes (the revenue part) in European countries – the Beveridge system of the National Health Service financed by collected taxes and the Bismarck mechanism of social health insurance (Olsen, 2017). In practice we usually see a mix of these two approaches. In recent years, efforts have been made to allocate part of the revenues from excise taxes for financing of the healthcare – by taxing unhealthy commodities (e.g., highly caloric or sugary diet). In 2017 the Czech Republic also discussed the possibility of a similar tax used for covering investments in hospitals, but it was not put into practice (CTK, 2017).

The Czech state budget is also involved in healthcare financing for people who are unable to pay for it themselves. It is done through "payments for state insured persons". This payment is unified for all persons belonging to this group. This amount, together with the collected premium, is then distributed on the basis of age, sex and from the year 2018 also based on pharmaceutical economic groups among health insurance companies (Act No. 592, 1992). It is a known fact that revenues and expenditures associated with state insured persons differ significantly (Gajdošová, 2017; Mertl, 2011).

The paper deals with one of the most topical questions of today's Czech healthcare financing issues, as the future of this payment is defined only until the year 2020 and further development is unclear (Act No. 297, 2017; MoF, 2017b). In light of these facts, the research question focuses on the analysis of the possible approaches to determine the amount of the payment. The answer to this question is crucial and should be used by policymakers as one of the bases in case of intervention in this mechanism. The undisputed added value of this question is its possible use in real decision–making; thus, this approach can be considered as an evidence-based policy.

The paper is divided into three parts (excluding introduction and conclusion). The first part evaluates the significance of these payments in healthcare financing and state budget expenditures in the Czech Republic. The second one describes structural elements of payments. The most important part is the third one, where approaches for determination of the assessment base are included. The last section is based on these scenarios and demographical projections and focuses on development of this payment is calculated until the year 2030.

The data on the numbers of state insured persons are obtained from the Czech Ministry of Finance (MoF, 2005-2017). Total payments for state insured persons are also retrieved from statistics published by the same institution (MoF, 2017a). To meet the stated goals, the article uses general scientific methods including the method of analysis, comparison and specification. The results obtained by quantitative analyses are also generalized. The synthesis method is used at the end of this contribution.

1 SIGNIFICANCE IN THE PUBLIC FINANCE SYSTEM OF THE CZECH REPUBLIC

There are many ways to evaluate the significance of these payments in the Czech Republic's financial system.

At first, a table with an absolute indicator is included. There we can see that in the analysed period the payment almost doubled. There is no information about the development of other related variables needed for significance evaluation, so the share in the total budget expenditures was calculated. Payments for state insured persons are an additional source to collected premiums for public healthcare system financing, but there are other revenues in the system, which means that the share in total revenues can be the best indicator (see below).[2]

Tab. 1 » Total payments for state insured persons (bn CZK)

2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
33.7	43.0	47.5	47.3	48.7	52.7	52.7	52.9	53.7	59.9	60.9	62.3

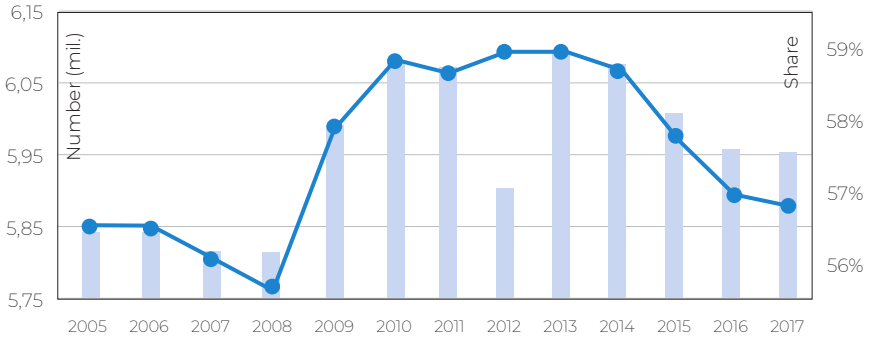
Source: (MoF, 2017a)

The payments for state insured persons are undoubtedly influenced by the number of these persons. Another aspect that is also closely linked to the number of these persons is their high share in the total number of insured persons and whether this kind of "social benefit" is necessary for this number of state insured

[2] Under the standard of national accounting ESA 2010, public health insurance system is part of general government sector (subsector S.1314), if the public health insurance system is in deficit, it also has an impact on the general government sector (CZSO, 2015).

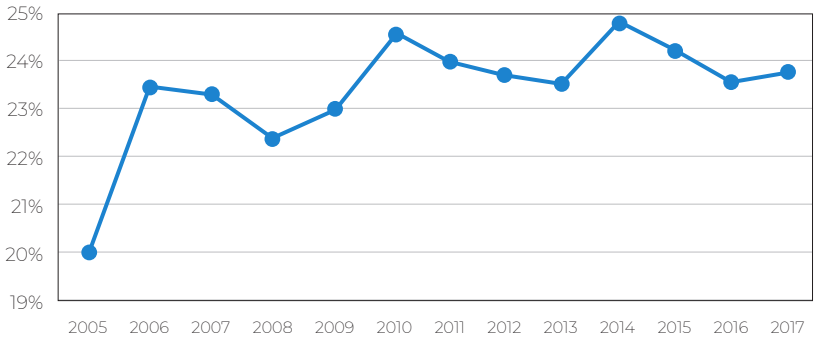
persons. The number of state insured persons is linked to economic development (especially job seeking category) and demographical conditions (pensioners and children are the majority) – see Figure 5.

Fig. 1 » Average total number of state insured persons and their share in total number of insured persons in healthcare system



Source: authorial computation based on (MoH, 2005-2016; (MoH, 2017)

Fig. 2 » Share of payments in total healthcare system revenues



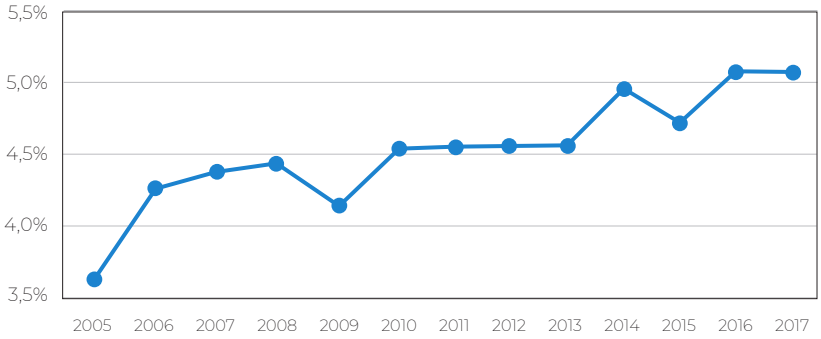
Source: authorial computation based on (MoF, 2017; (MoH, 2005-2016; MoH, 2017)

Figure 2 focuses on the importance on the revenue side of the Czech healthcare funding (for more details see annexes). Payments for state insured persons are an additional source to collected premiums. These payments represent around

a quarter of total revenues. By comparing Figures 1 and 2, we get a clear evidence of solidarity of the Czech system (for more than a half of all insured persons are paid just about 25% of healthcare revenues, the major part of collected premiums comes from employees and their employers).

Based on previous information a question might arise as to why the payment is not higher. The answer to this question is quite challenging because the payment is at the same time expenditure of the Czech state budget (see annexes). At present, Czech budgets have high share of mandatory and quasi-mandatory expenditures. Between the years 2005 and 2017, it was on average about 74% of all expenditures (Government, 2017). Therefore, the possible space for active fiscal policy is already very limited and increasing the mandatory spending is not desirable.

Fig. 3 » Share of payments in total state budget expenditures



Source: authorial computation based on (MoF, 2017a; MoF, 2018a; MoF, 2018b)

2 STRUCTURAL ELEMENTS OF PAYMENTS FOR STATE INSURED PERSONS

This part of the paper concentrates on mechanisms that are necessary to understand the suggestions in the key part of the article.

These payments are set by the Ministry of Finance in cooperation with the administrator of a special redistribution account (i.e., the VZP insurer) (Act No. 592, 1992). In the year 2017, the system of premiums redistribution was amen-

ded (because of the above mentioned new system of pharmaceutical economic groups) (Act No. 145, 2017). For our purposes we can assume that the nature of the structural elements remained the same.

The monthly payment for the next month1 is calculated based on the equation:

$$Payment_M = (R \times AB_M) \times (N_t + C_{t-3}). \quad (1)$$

All mentioned variables need to be described in more detail (current state and development in the past, from 2005 to 2017).

- $Payment_M$ = total payment in a specific month,
- Rate of public insurance premiums (R) = 13.5 %,throughout the whole period
- Monthly assessment base for state insured persons (AB_M) = in monitored years, the figure was mostly growing and so was the monthly payment (see Figure 4)[4],
- The number of state insured persons in the month of the payment (N_t) = this indicator is influenced by a number of factors (e.g., unemployment, economic development, etc.). It should be mentioned that no significant new groups of state insured persons were established and the shares of individual groups did not change in the analysed period either (for indication, Figure 5 shows the structure in 2017).[5]
- Correction of the number of state insured persons in the month *t-3* (C_{t-3})[6]= this feature was crucial for deciding in which years this analysis should be done. System t-3 has been used since 1 January 2005 (Decree No. 644, 2004).

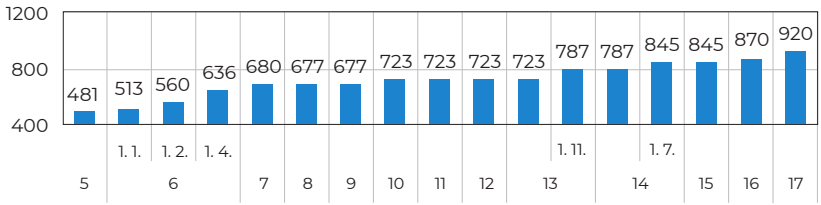
[3] Under relevant legislation, the payment paid in month t is the payment for the next month (t+1). (e.g., the payment for April 2018 is paid in March 2018) (Act No. 592, 1992).

[4] After multiplying the assessment base by the rate, the result is rounded up to the whole crown.

[5] This is a simplified overview, a list of all groups can be found in the related legislation (Act No. 48, 1997).

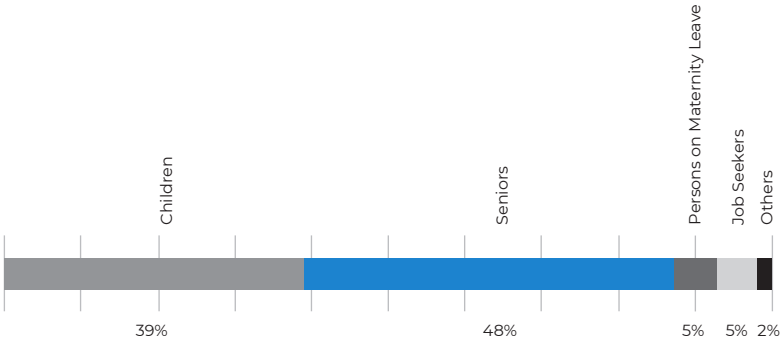
[6] E.g., the number of state insured persons in March 2018 is corrected by the number in December 2017. Since 1 January 2018 the rule has changed, the present decree was abolished, but the same mechanism was incorporated directly into the law (Act No. 145, 2017). Until 2005, the conditions were not precisely defined.

Fig. 4 » Monthly payment per one person between the years 2005–2017 (CZK)



Source: authorial computation based on (MoF, 2017)

Fig. 5 » Structure of state insured persons in the year 2017



Source: authorial computation based on (MoF, 2017)

3 CONSIDERED APPROACHES AND THEIR IMPACT IN THE YEAR 2021

As is shown in Figure 4, the changes in the payment per one person differed throughout the period. This can be explained by the mechanism of the change. It is stipulated in a government decree that takes into account the development of the average salary published by the Czech Statistical Office, the available resources of the state budget and the financial balance of the public health insurance system (Act No. 592, 1992). For the year 2018, the same mechanism of increasing the assessment base to 7,177 CZK is used (Government Regulation No. 140, 2017). Act No. 297/2017 Coll. meant a turning point, as the assessment for the

years 2019 and 2020 was directly incorporated into the law. For the year 2019 it is 7,540 CZK and for the year 2020 it is 7,903 CZK.

Tab. 2 » Prediction of payments for state insured persons[7]

	2018	2019	2020
Monthly assessment base (CZK)	7,177	7,540	7,903
Payment per person (CZK)	969	1,018	1,067
Total payment (bn CZK)	69.80	73.32	76.85
Number of state insured persons	6,002,000	6,002,000	6,002,000

Source: authorial computation based on (MoF, 2017b; Government, 2017)

The aim is to verify the different scenarios and their impact in the year 2021. The options are as follows: the same amount as the average absolute increase *(AAI)* between the years 2005 and 2020, the same amount as the average relative increase (*ARI*) between the years 2005 and 2020, the same proportion of total state budget expenditures (*PB*) as in the year 2019[8], the same amount as the average proportion of total healthcare system revenues (*APH*) between the years 2005 and 2020.

These options represent the result of rational thinking about possible decisive criterion chosen for assessing the payment for the year 2021. Of course, it is also possible to consider more complicated and complex models working with a number of distinct input variables. We used simple scenarios but this is their advantage as they are easy to comprehend.

[7] The State Budget of the Czech Republic for the year 2018 is used because it was published later than the Budgetary Strategy 2018–2020. The number of insured persons was calculated by the authors of this paper, this quantity is important for predicting possible assessment base.

[8] It is expected that the total state budget expenditures in the year 2021 will be rising in the same amount as between the years 2019 and 2020. The calculation is also done with an average proportion of the total state budget expenditures between the years 2005 and 2020. As the average proportion is just 4.7%, it means a year-on-year decrease in the payment, which is unrealistic.

3.1 AVERAGE ABSOLUTE INCREASE BETWEEN THE YEARS 2005 AND 2020

This indicator was chosen because it is not possible to expect a steep increase in this expenditure. The average absolute increase (*AAI*) is calculated as:

$$AAI = \frac{\Sigma(P_t - P_{t-1})}{n} = \frac{43.12}{15} = \mathbf{2.87} \quad (2)$$

Where Pt is the total payment in year t; Pt-1 is the total payment in year *t-1* and n is the number of analysed years. These symbols are used in the following equations.

3.2 AVERAGE RELATIVE INCREASE BETWEEN THE YEARS 2005 AND 2020

The relative indicator was chosen for a similar reason like the previous one. The average relative increase (*ARI*) is calculated as:

$$ARI = \frac{\Sigma(P_t / P_{t-1})}{n} = \frac{15.88}{15} = \mathbf{1.06} \quad (3)$$

3.3 PROPORTION OF TOTAL STATE BUDGET EXPENDITURES IN THE YEAR 2019

One possible way to determine the payment in the year 2021 is to maintain its share in state budget expenditures. This, however, is unrealistic, firstly because of the legislative process and secondly, in order to ensure foreseeability for sovereign entities to use for their calculations the amount used in the previous year (i.e. 2020), it is necessary to use the amount for 2019.

The proportion of total state budget expenditures (*PB*) is calculated as:

$$PB = \frac{P_{2019}}{BE_{2019}} = \mathbf{5.47\ \%} \quad (4)$$

Where P2019 is the total payment in the year 2019 and BE_{2019} is the total state budget expenditures in the year 2019.

3.4 AVERAGE PROPORTION OF TOTAL HEALTHCARE SYSTEM REVENUES

Another way to assess the variable is to fix the ratio of the total system revenues. Here, the Ministry of Finance in cooperation with the Ministry of Health first calculate the share of payments in the total healthcare system revenues immediately after they evaluate the Annual Reports of Health Insurance Companies for the year 2019 (it is also necessary to omit one year). In the next step, the revenues of the system in 2021 will be estimated. And finally the share will be multiplied by the revenues to obtain an estimate of the required amount of payments and the change of the assessment base will be determined. The Average Proportion of Total Healthcare System Revenues (APH) is calculated as:

$$APH = \frac{\Sigma(P_t / THR_t}{n} = \frac{3.52}{15} = \mathbf{23.5\ \%} \qquad (5)$$

Where Pt is the total payment in year *t*; THR_t is the total healthcare system revenues in year t and n is the number of analysed years.

3.5 RESULTS

We can conclude that the obtained results are not the same, which was to be expected. Obviously, there are many factors that must be taken into account in the final decision (economic conditions and their impact on the state budget, employment and wages, various aspects of healthcare financing, etc.).

Tab. 3 » Results for payments for state insured persons in the year 2021

	Total (bn CZK)	Assessment base (CZK)	Per person (CZK)
Absolute increase	79.72	8,199	1,107
Relative increase	81.34	8,366	1,129
Proportion on budget exp.	78.56	8,080	1,091
Proportion on system rev.	77.71	7,992	1,079

Source: authorial computation

4 FUTURE PERSPECTIVES UNTIL THE YEAR 2030

There are many possibilities how to assess the number of state insured persons until the year 2030. The simplest model deals with groups containing only children (aged 0–14) and pensioners (aged 65+); but as they cover just about 78% of all state insured persons, this model is inaccurate. We use a different approach, which provides a more accurate number, based on this calculation:

The total number of state insured persons in year t ($NSIP_t$):

$$NSIP_t = (K_{ch} \times NPch_t) + (K_p + NPp_t) + AV_{oth} \times \\ \times (K_{ch} \times NPch_t + K_p + NPp_t) \tag{6}$$

Where K_{ch} is the average relation between children as a category of state insured persons and the number of inhabitants under the age of 15 (similarly the indicator K_p is used for pensioners). $NPch_t$ is the predicted number of inhabitants between the age of 0 and 14; NPp_t is the predicted number of inhabitants older than 65 and AV_{oth} follows average share of other groups of state insured persons (i.e., without children and pensioners) between the years 2005 and 2017 using the relevant statistics (MoF, 2005–2017 and CZSO, 2018a). The calculation of the last variable is needed to obtain a more realistic view of the situation, but it is based on the assumption of the same proportion of the selected groups and unchanged legislative background for the determination of state insured persons.

The prediction is based on a dataset from the medium variant of Czech demographical prediction to the year 2100 (specifically the table "Age Distribution of the Population by the Age Groups, Both Sexes (to 1.1.)") (CZSO, 2018b).

4.1 HYPOTHETICAL SCENARIOS OF PAYMENT

Two scenarios of payment are considered, the first one assumes the same assessment base during the whole period and the second one uses the same year-to-year growth as it is calculated between the years 2020 and 2021. As other finding can be seen the influence of demographical conditions on total payment, because the total number of state insured persons remains the same for both versions.

Tab. 4 » Results for payments for state insured persons ($AB_{2021} = AB_{2030}$)

Bn CZK	2022	2023	2024	2025	2026	2027	2028	2029	2030
AAI	84.68	85.19	85.34	85.23	85.13	85.22	85.33	85.77	86.31
ARI	86.36	86.88	87.03	86.92	86.83	86.91	87.03	87.47	88.02
PB	83.45	83.96	84.10	84.00	83.90	83.99	84.10	84.53	85.06
APH	82.38	82.88	83.02	82.92	82.83	82.91	83.02	83.44	83.97

Source: authorial computation

The first one shows the situation with an unchanged assessment base, which may cause minor year-to-year changes (when comparing with development in the past).

Tab. 5 » Results for payments for state insured persons ($AB_{t+1}/AB_t = AB_{2021}/AB_{2020}$)

Bn CZK	2022	2023	2024	2025	2026	2027	2028	2029	2030
AAI	87.85	91.70	95.30	98.75	102.33	106.28	110.41	115.13	120.20
ARI	91.38	97.27	103.10	108.96	115.16	121.97	129.23	137.43	146.34
PB	85.33	87.78	89.91	91.81	93.77	95.98	98.27	100.99	103.91
APH	83.15	84.44	85.38	86.07	86.78	87.68	88.62	89.91	91.32

Source: authorial computation based on (MoF, 2017b; Government, 2017)

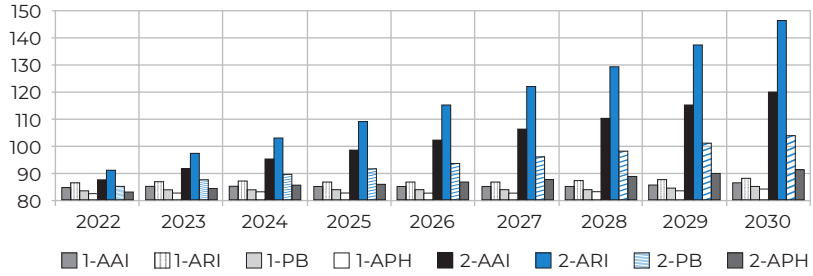
The second scenario with increasing assessment base is more interesting and maybe more likely. This table shows different results with different year-to-year growth. Especially the prediction for the last year 2030 is remarkable when comparing the obtained values.

4.2 EVALUATION

Figure 6 is included for better evaluation as it shows the joined impact of all considered mechanisms (scenario 1 and scenario 2). From the point of view of the state budget, the most expensive version is 2-ARI (average relative increase when using parameters of the years 2020 and 2021), when the amount for the

year 2030 exceeds 140 bn. CZK; conversely, the cheapest version can be determined by comparing the same part of the figure, possibility APH (average proportion of total healthcare system revenues) with the amount in the year 2030 under 100 bn. CZK. Clear system can be fixed proportion of the state budget expenditures (PB), whose advantage is its predictability in the future based on the existence of the budgetary frameworks and midterm budgetary strategic documents. This approach does not show any significant growth. The AAI is a simple option; however, it is quite inappropriate in our time to introduce new mechanism using this structural element.

Fig. 6 » Comparison (bn CZK)



Source: authorial computation

CONCLUSION

As the title of the article suggests, the discussed subject will become one of the biggest issues in on the coming years in terms of public finances allocated into the health system. Another related topic is the healthcare financing perspective is connection with the most represented groups, i.e. children and pensioners. The increase in their numbers undoubtedly reflects the developments in the demographic area. The article describes how the state payment is determined. The key point in the current discussions is the mechanism based on which the assessment base is determined. Its determination leads us to the conclusion that the most important aspects will be the available resources of the state budget and the needs of the healthcare system. As we know, the interval of the possible public spending increase is quite wide. Further publishing activities should focus on applying econometric approaches to determine the changes. Subsequently, these data could be

compared with results obtained in this article. Other crucial fact for future analyses of these payments is certainly the impact of the current economic growth, which influences the model trend development and has an impact on wages, the minimum wage, demographic structure, unemployment, etc. Recommendations for future research directions also include modelling of possible future scenarios.

ANNEXES

Tab. 1 » Comparison with total budget expenditures (bn CZK)

	2006	2007	2008	2009	2010	2011	2012	Av. Share
Payment	43.0	47.5	47.3	48.7	52.7	52.7	52.9	
Budget exp.	1020.6	1092.3	1083.9	1167.0	1156.8	1155.5	1152.4	
Share	4.2 %	4.3 %	4.4 %	4.2 %	4.6 %	4.6 %	4.6 %	
	2014	2015	2016	2017	2018	2019	2020	4.6 %
Payment	59.9	60.9	62.3	65.3	69.8	73.3	76.8	
Budget exp.	1211.6	1297.3	1219.8	1279.8	1293.3	1341.5	1388.6	
Share	4.9 %	4.7 %	5.1 %	5.1 %	5.4 %	5.5 %	5.5 %	

Source: authorial computation based on (MoF, 2017a; MoF, 2017b; MoF, 2018a; MoF, 2018b; Government, 2017)

Tab. 2 » Comparison with healthcare system revenues (bn CZK)

	2005	2006	2007	2008	2009	2010	2011	2012	Av. Share
Payment	33.7	43.0	47.5	47.3	48.7	52.7	52.7	52.9	
Reve-nues	168.9	182.8	202.8	211.4	212.2	215.6	220.4	223.6	
Share	20 %	24 %	23 %	22 %	23 %	24 %	24 %	24 %	
	2013	2014	2015	2016	2017	2018	2019	2020	23.5%
Payment	53.7	59.9	60.9	62.3	65.3	69.8	73.3	76.8	
Revenues	228.6	241.3	252.6	264.9	276.6	290.5	303.8	316.9	
Share	24 %	25 %	24 %	24 %	24 %	24 %	24 %	24 %	

Source: authorial computation based on (MoF, 2017a; MoF, 2017b; MoH, 2005–2016)

REFERENCES

Act No. 48/1997 Coll., On Public Health Insurance and on Amendments to Certain Related Acts, as amended

Act No. 297/2017 Coll., Amending Act No. 592/1992 Coll., on Public Health Insurance Premiums, as amended.

Act No. 592/1992 Coll., on Public Health Insurance Premiums, as amended.

CZSO - Czech Statistical Office (2015). *Přehled metod, postupů, zdrojů použitých při sestavení deficitu a dluhu a založených na sestavení sektoru vládních institucí podle ESA 2010.* Praha: Český statistický úřad. [online] Available at: https://apl.czso.cz/nufile/Prehled_metod_a_zdroju_2015.pdf [Accessed 18 Jan 2018].

CZSO - Czech Statistical Office (2018a). *Demografická příručka – 2016.* [. Praha: Český statistický úřad. [online] Available at: https://www.czso.cz/csu/czso/demograficka-prirucka-2016 [Accessed 26 Apr 2018].

CZSO - Czech Statistical Office (2018b). *Projekce obyvatelstva České republiky do roku 2100. Prahae: Český statistický úřad.* [online] Available at: https://www.czso.cz/csu/czso/projekce-obyvatelstva-ceske-republiky-do-roku-2100-n-fu4s64b8h4 [Accessed 25 Apr 2018].

Decree No. 644/2004 Coll., on Rules for the Management of the Special Public Health Insurance Account, the Average Costs and the Rules of Procedure of the Supervisory Body.

DRBAL, C. (2005). *Česká zdravotní politika a její východiska.* Praha: Galén.

GAJDOŠOVÁ, E. (2017). Impact of Demographic Trends on Sustainability of Healthcare Financing in the Czech Republic. In: *Proceedings of the 21st International Conference Current Trends in Public Sector Research.* Brno: Masaryk University, pp. 268–273.

Government of the Czech Republic (2017). *Vládní návrh zákona o státním rozpočtu České republiky na rok 2018.* Praha: Ministerstvo financí. [online] Available at: http://www.psp.cz/sqw/text/tiskt.sqw?O=8&CT=2&CT1=0 [Accessed 14 Dec 2017].

Government Regulation No. 140/2017 Coll., on Determination of the Assessment Base of the Persons for whom the Healthcare Insurance premiums are Payable by the State.

CHERNEW, M., NEWHOUSE, J. (2011). Health Care Spending Growth. In: Pauly, M., McGuire T., Barros, P. (Eds.): *Handbook of Health Economics: Volume 2.* Amsterdam: Elsevier, pp. 1–43.

HEADY, Ch. (2015). The effects of ageing on the financing of social health provision. In: *Fiscal Sustainability of Health Systems: Bridging Health and Finance Perspectives.* [online]. Paris: OECD Publishing. Available at: http://www.oecd-ilibrary.org/social-issues-migration-health/fiscal-sustainability-of-health-systems_9789264233386-en [Accessed 16 Feb 2018].

JANEČKOVÁ, H., HNILICOVÁ, H. (2009). *Úvod do veřejného zdravotnictví.* Praha: Portál.

MAAYTOVÁ, A. (2012). *Otázky ekonomiky zdravotnictví s ohledem na zvyšování efektivnosti*. Praha: Wolters Kluwer.

MARTÍN, J., M., GONZÁLES, M., CANO GARCÍA, M. (2011). Review of the Literature on the Determinants of Healthcare Expenditure. *Applied Economics,* 43(1): 19–46. DOI: 10.1080/00036841003689754.

MERTL, J. (2011). Financování zdravotnictví ve stínu ekonomické krize. In: *Úloha veřejných financí v řešení problémů a dopadů současné krize.* Praha: Wolters Kluwer, pp. 116–136.

MERTL, J. (2014). The issues of longevity and health care systems. In: *Proceeding of the 19th International Conference Theoretical and Practical Aspects of Public Finance 2014.* Praha: Wolters Kluwer, pp. 179–187.

MoF - Ministerstvo financí ČR (2005–2017). *Počet státních pojištěnců v období 2005–2017.* Praha: Ministerstvo financí ČR. Unpublished (available on request).

MoF - Ministerstvo financí ČR (2017a). Platba státu v období 2005–2017. [online] Available at: http://data.mfcr.cz/cs/dataset/platba-statu-za-statni-pojistence [Accessed 12 Mar 2018].

MoF - Ministerstvo financí ČR (2017b). *Rozpočtová strategie sektoru veřejných institucí České republiky na roky 2018 až 2020*. Prahague: Ministerstvo financí ČR. [online] Available at: http://www.mfcr.cz/cs/verejny-sektor/statni-rozpocet/rozpoctova-strategie/2017/rozpoctova-strategie-sektoru-verejnych-i-28387 [Accessed 14 Feb 2018].

MoF - Ministerstvo financí ČR (2018a). Měsíční pokladní plnění státního rozpočtu v roce 2017. [online] Available at: http://www.mfcr.cz/cs/verejny-sektor/statni-

-rozpocet/plneni-statniho-rozpoctu/2017/mesicni-pokladni-plneni-2017-27527 [Accessed 14 Jan 2018].
MoF - Ministerstvo financí ČR (2018b). Monitor státní pokladny. [online] Available at: https://monitor.statnipokladna.cz/2017/ [Accessed 10 Jan 2018].
MoH - Ministerstvo zdravotnictví ČR (2005-2016). *Výroční zprávy a účetní závěrky zdravotních pojišťoven* [online] Praha: Ministerstvo zdravotnictví ČR. Available at: http://www.psp.cz/sqw/sntisk.sqw [Accessed 26 Feb 2018].
MoH - Ministerstvo zdravotnictví ČR (2017). *Zhodnocení zdravotně pojistných plánů zdravotních pojišťoven na rok 2017*. [online] Praha: Ministerstvo zdravotnictví ČR. Available at: http://www.psp.cz/sqw/sntisk.sqw [Accessed 22 Feb 2018].
MoH - Ministerstvo zdravotnictví ČR (2014). *Zdraví 2020 – Národní strategie ochrany a podpory zdraví a prevence nemocí.* [online] Praha: Ministerstvo zdravotnictví ČR. Available at: https://www.mzcr.cz/Verejne/dokumenty/zdravi-2020-narodni-strategie-ochrany-a-podpory-zdravi-a-prevence-nemoci_8690_3016_5.html [Accessed 12 Feb 2018].
OLSEN, J. (2017). *Principles in Health Economics and Policy.* Oxford: Oxford University Press.
OXLEY, H., MORGAN, D. (2009). Patterns of Health Care Spending Growth. *Achieving Better Value for Money in Health Care.* Paris: OECD Publishing. pp. 19–53. DOI: http://dx.doi.org/10.1787/9789264074231-en.

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ECONOMIC LINKS BETWEEN THE PUBLIC SECTOR AND THE HEALTH LITERACY OF THE POPULATION

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ABSTRACT

The mutual interplay of health and education policy at both national and regional levels is a testimonial to the health literacy standards of the population, from which the quantitative and qualitative component of human capital arises, of which the healthcare capital is an important organic component. These capital components of human resources are an important determinant for ensuring the stability of economic growth. This is confirmed by economic theories of endogenous growth that can fully rely on empirical research based on a correlation of investment in human resources on the one hand, and population welfare, the quality of life and the economic growth on the other. Investors in human resources in the field of health through the creation of educational programmes are numerous, from the state authorities to the lowest territorial units. Due to the application of the principle of subsidiarity in the implementation of social policy intentions, the position of investors, municipalities and regions is growing in importance, as a comprehensive view of creating quality infrastructure for human life and providing quality public services in line with societal challenges has emerged in recent years. A connecting factor is the quality of human resources as a key factor in the competiveness of a region.

Keywords: *health literacy, social policy of the public sphere, human capital*

JEL Classification: A12, B41, D00, E00, D24

1 INTRODUCTION

The aim of the paper is to highlight current issues of the importance of health literacy in building the wealth of a society by investing in human capital, from which the health of the population is derived as a source of stable economic growth and social welfare of the population. Health, which concerns all groups of the population, is one of the most important preconditions for a happy, peaceful and fulfilled life of every individual. It is not only a state when illness is absent, it is generally a good feeling of life experienced by a person in three dimensions – physical, mental and social. Therefore, its protection and its consolidation become an indispensable, integral part of the educational process. Health care can be imagined both in historical development and in relation to healthcare as a system. One of the important, though relatively new, concepts is health literacy (Marádová, 2014). It allows people to get, evaluate and use information so that it can have a positive influence on their health. Therefore, health literacy is an integral part of the theory of human capital; its importance requires respect for the interdisciplinary approach of social sciences, especially economics, public economics, theory of economic, social and regional politics, pedagogy and andragogy.

Health literacy has become one of the outstanding tasks of raising and promoting health and preventing risk factors. One of its basic pillars is the implementation of the principle of subsidiarity, according to which decision-making in and responsibility for these public affairs should take place at the lowest levels, such as villages, municipalities, cities and regions. The objective of this principle is to ensure a long-term stability and competitiveness of the territorial units with the support of the Smart Region and Smart City programmes. Therefore, for the realization of investment projects in the development of the population's health literacy, it is necessary to involve all relevant actors of the public sphere and civil society in providing multiple-source financing for individual activities.

2 METHODS OF PROCESSING

The functioning of the economic system in the national and regional dimensions is connected with the institutions, which are a logical prerequisite for ensuring stable economic growth, whose important determinant is the social and health

system. It builds on the aims of social and regional policy, which is an integral part of public economic policy. From its level, the proper health literacy of the population develops. The bodies involved in the creation of health literacy are also institutions and communities.

For the above reasons, the methods of analysis, comparison, observation and synthesis are applied in the process. These are applied to the development of the phenomenon of health literacy, taking into account the importance of applying the principle of subsidiarity in the context of urban and regional policies. At the same time, the reality of the development of health literacy is compared with that of the theoretical concept of human capital.

3 RESEARCH RESULTS

3.1 HEALTH FROM THE POINT OF VIEW OF ECONOMIC THEORY

Human health is, in the current conception, as defined by the World Health Organization, understood to be a balanced state of physical, mental and social well-being. It is formed and influenced by many factors and is a prerequisite for an active and happy life, for proper work performance. This is a prerequisite for ensuring adequate stable economic growth. This is why health education is one of the priorities of education programmes, the level of which depends on public policy at the national and regional levels.

Thus, the state of health is a value that is not of a tangible nature and is tied to a particular individual and, as a rule, cannot be classified as goods and therefore cannot be fully exchanged on the market. There are two definitions of negative and positive health. Negative delimitation perceives health as statically assessed state of the disease-free organism, while positive definition looks for favourable health signs. The positive definition also distinguishes the static (older concept) and the dynamic concept of health (a newer concept). An older concept defines health as a state of perfect physical, mental and social satisfaction without the presence of illness or the occurrence of a physical defect. The newer concept looks at health as a dynamic "life process" that is constantly changing and is influenced by a number of factors such as elements of the natural and social environment.

For the reasons outlined above, it cannot be regarded as a purely economic

asset, but as a value with an individual and social aspect. "Individual" means that every person decides on their own health, many people realize its value when they become ill. Therefore, for the understanding of the value of health, education that enhances dignity and self-identity is important. The social worth of the value of health characterizes it as a source for the economic and social development of society; it is the result of many relationships that make an individual part of a wider human community. This is why health care also belongs to society. The main motive for social structures should be to make people more interested in health and to act as a model for as many people as possible to find their way to health. *"Health care is therefore not a social duty but a personal concern"* (Holčík, 2010). The value of health, both from an individual and social point of view, is constantly changing over time, is difficult to measure and contains a number of cultural, political, social, economic and ethical elements. Health is generally regarded as a positive externality and a necessary condition of human existence (Rivera & Currais, 1999).

The threat to the health and life of an individual poses a risk not only to them and their closest social environment (such as the family) but also to the whole society. Therefore, sickness, accidents and disability are, according to social policy theories, pathological social events. All risks that threaten good health can never be fully eliminated. A proper reduction can be realized with appropriate rules. These include, in particular, appropriate organizational arrangements and management culture. According to the theoretical concept of sociologist Niklas Luhmann, all the risks of contemporary society are the result of decision-making (Luhmann, 1984). The risk assessment and management process also harms institutional capacities and capabilities, which may lead to conflicts with other organizational structures. As a result, institutions have to address, besides external, societal risks, the management of their "internal" institutional risks. Institutional risk management can also improve the management of societal risks, for example by improving the decision-making process, but it can also have potentially negative consequences if institutions manage their "risks" at the expense of societal risks. This spiral feedback between societal and institutional risks requires the exploration of factors shaping the balance between managing societal and institutional risks and risk colonization. An idealized model is an attempt to break

down and analyse closed links between the risks and their regulation.

According to individualization theory, an individual is responsible for themself, but depends on conditions that they cannot influence (Beck, 2007). This is fully in line with Ulrich Beck's concept of individualisation. From this it is inferred that people today are forced to believe experts without knowing what they know and whether they are really experts. It is therefore natural that people lose confidence in professionals and politicians because they are often forced to live in insecurity and with feelings of discrimination and injustice because of their decision-making. In this context, Anthony Giddens focuses on two dichotomies: trust and risk, safety and dangers. The reason for his orientation is societal changes that have created a new state of psychological vulnerability and ultimately a new risk profile. Giddens associates risk with objective and subjective conditions. The objective conditions relate to the intensity of the harmful effects of an increased number of risk sources (technologies, ecological and natural disasters, etc.), hazards resulting from "nature transformation" (pollution, contamination, desertification, deforestation) and the institutionalization of certain types of risks in the social system (for example, voluntary risk).

3.2 CONFLICT OF ECONOMIC AND ETHICAL INTERESTS AS A MANIFESTATION BETWEEN THE EFFECTIVE ALLOCATION OF RESOURCES AND THE VALUE SYSTEM OF SOCIETY IN THE CREATION OF HUMAN CAPITAL

Liberal economists are fully convinced that the market is a prerequisite for all resource allocation efficiencies. However, reality confirms the assertion that this efficiency is not always the only goal that society is pursuing. The example of education and health can be fully demonstrated. In the real world, the market has for ever been offering goods that can be harmful to consumers. In the early 18th century, the Dutch writer, philosopher and economist Bernard de Mandeville, in his essay The Fable of the Bees: or Private Vices, Public Benefits, considered as the basis of economic liberalism the believes that the desire for personal welfare is the source and precondition of economic growth and the wellbeing of the whole society. His work includes, among other things, controversial passages, such as the refusal to educate the social group of the poor, as education could create

a desire for property. In the same period, the prominent Irish philosopher and Anglican theologian George Berkeley described Mandevill's theoretical concept as immoral. At the same time, it is also necessary to bear in mind that Mandeville should rather than defend the existence of vices, point out that each law or "moral value" was originally a defence of the utilitarian interest of a group, anticipating the conclusions of the modern philosophy of law.

In some cases, the market ensures an efficient allocation of resources, but effective allocation of resources is not usually the only goal a company is tracking. The market may offer consumers goods that are harmful to them or, on the contrary, some goods are being replaced by other goods that are less benficial for the consumer. This may be due to the fact that consumers are not market sovereigns and are manipulated by advertising. The state is then trying to reinforce the position of consumers in the market by intervening, for example by restricting some types of advertising. Another reason for state intervention may be the preferences of some consumers that society considers to be wrong and attempts to correct them (a typical example is the demand of drug addicts). However, the rationale for state measures that promote the value system of society is mostly ethical rather than purely economic.

For the above reasons, state interventions may take the form of a complete ban on the sale of certain goods to all consumers (as is the case with drugs) or selected consumer groups (for example, prohibiting the sale of alcoholic beverages to children). Restrictions on the consumption of certain goods (e.g., alcoholic beverages) can also be pursued by higher taxation on other goods. On the other hand, the state can support the consumption of other goods and services (examples: support for the construction of physical and social health facilities) by tax relief or subsidies. It is clear that efficient allocation of resources may conflict with other company goals. A classic example is full or partial prohibition in the history that leads to the reduction of highly efficient production of alcoholic beverages, thereby reducing the tax revenues of the state.

3.3 HUMAN CAPITAL THEORY AS A SOCIAL POLICY PURPOSE FOR CREATING HEALTH LITERACY OF THE POPULATION

The theory of human capital emerged from the intellectual environment of the

Chicago School of Economics in the early 1950s. The central methodological principle of the Chicago School is the elucidation of economic processes based on the principle of maximizing the net benefit of an economic entity in a market environment. This approach is also applied in non-market areas. This also leads to the basic conception of all economic life contexts in the theory of human capital. This was developed by key figures of the school, Gary Becker, Theodore W. Schultz and others.

According to Gary Becker's concept, human capital is divided into a pool of personal and social capital. Personal capital is further divided into "habitual" and "imaginative". Becker's theoretical analysis is based on the presumption that each individual is an almost universal consumer. The amount of consumption is determined by income, whereas its orientation is based on his preferences (Becker, 1997). These are determined by the biological and psychological typology of personality, social environment and customs. It is clear that each person is born with different abilities that have evolved since childhood.

This experience influences the desires and choices of adolescents and adults partly through habits that still influence adult behaviour since childhood. They can significantly affect the life of the individual. According to the spiritual father of Sigmund Freud's psychoanalysis, the influence of early childhood on the later adult behaviour is decisive. Then childhood experiences could have a major impact on preferences and adult choices. Children spend their early years in the care of their parents and close relatives who decide what they will eat, what they will read, hear, what they will notice and what they will be indifferent to. The enormous influence that this has on a child's choices explains the close link between children and parents in many attitudes and choices, including religious and political affiliation, smoking, use of alcohol and other addictive products, divorce, healthy eating, vegetarianism or the preference for exotic kitchens. Based on the natural modeling of parents' influence on children in maximizing usefulness, it is assumed that the preferences of children and adults develop from an early childhood. Altruistic parents partially maximize their own benefits by maximizing the benefit of their children. They try to control the development of their children's preferences to increase their benefits (Becker, 1997).

Habits are harmful if the current consumption reduces future benefits. An

example of this is health threatening heavy addiction to smoking, alcoholism or drugs. Similarly, habits are beneficial if greater current consumption increases future benefits, such as the introduction of a regular physical activity, i.e. a healthy lifestyle. It is natural that bad habits attract more attention than good ones, but the reality is that rational behaviour also implies that the strong habits examined are more damaging than beneficial. Proof of this is the type of contemporary modern consumer society. Based on these analyses, there is considerable active promotion of unhealthy lifestyles and failure of education systems to equip individuals with adequate skills to get, understand, evaluate and use information on how to improve their health. This paradox has resulted in the health literacy crisis in Europe and elsewhere in the world. Almost half of the adults in European countries have inadequate or problematic habits that negatively affect health literacy. This is manifested in the quantitative and qualitative dimension of human capital, whose main determinants, according to modern economic theories, are investment in health and education as a precondition for ensuring stable macroeconomic growth (Brinkley, 2001).

As the second, "imaginary" component of personal capital, Becker identifies the trained ability of an individual to anticipate the future – the "imagination capital" (Becker, 1997), which helps them to better appreciate future benefits. Given that the theory of the redistribution system is looking for ways to "decipher" human behaviour, it could help develop this component of the capital. It is the imagination of wider contexts, some kind of insight into own behaviour as well as the behaviour of other people, which can be a good entry capital to life. Social capital then determines the influence of other people's preferences on an individual's social environment. The rise in social capital can increase or decrease individual benefits. This can be interpreted as an example when the pressure of a reference group on a teenager to start a healthy lifestyle increases their benefit, and their dependence on the behaviour of others can create different externalities of a positive nature.

Sociology also offers a well-known theory of human capital as a reaction to the economics of the concept of human capital that was developed by Pierre Félix Bourdieu. It divides human capital into four areas (Bourdieu, 1986): economic (material wealth), cultural (education, awareness), social (recognition, contacts) and symbolic (prestige from different types of capital). It is undoubtedly a wider

concept of the category of human capital seeking a certain permeability and transferability of capital from one to another, the third or fourth form of capital. Education is basically a cultural form of capital, but it is also an important factor in capital formation in other areas. In essence, Bourdie criticized the education systems in Western Europe at the beginning of the second half of the 20th century, especially their role in "preserving" the existing social differences.

It follows from the above text that the notion of human capital is not theoretically anchored or precisely specified. There is no uniform definition. In fact, the term economic refers to the knowledge and abilities of an individual and their value generated by investments. In sociology, human capital is a means of social success and position. However, the role of education is always mentioned in connection with the creation, content or structure of the various definitions of human capital. The theory of human capital does not include only an economic and sociological aspect. This is clearly evidenced in pedagogy, which has space for research and assessment of the "input component" of human capital and thus school education. This includes, in particular, the question of the target structures, content, forms and methods of educational processes in the school system. The verification of the results of the pedagogical process is a fundamental problem. Some current topics of pedagogical science, such as functional literacy, intercultural education, alternative education, marketing of educational institutions and others, are also affected by the creation of human capital.

Andragogy, in connection with human capital, focuses on the issue of adult education, in particular on its professionally oriented part (Abel, 2013). It should give some relevant insights into this component of human capital development. This is the design, implementation and evaluation of courses, their quality and impact on work performance. It does not only concern career development processes. Attention should also be paid to interest-based education, as this area also relates to the adaptation of an individual to life in society and to their lifestyle.

3.4 INVESTING IN HEALTH IN THE CONTEXT OF ECONOMIC GROWTH

G. Becker defined health as part of human capital. He did not formulate a theoretical model of health investment, which was done by Michael Grossman, whose model analyses consumers' choice of consumption and investment in health

supplies, thus affecting their length of life along with factors that influence such choices. Grossman used Becker's general model of investment in education and training at work, but he claimed that the impact of health and education on an individual's activity differed. He argued that it was not easy to assume that better health would automatically lead to higher wages, which is the case with education. While Grossman's education affects productivity, health affects the amount of time an individual can devote to work (or consumption). Grossman thus created the theoretical concept of demand for healthcare by allocating health capital from the theory of human capital. Based on this concept, each person is an active "producer" of their health (health capital) and as inputs for "production" uses purchased healthcare and their time (Grossman, 1972).

Regarding population health in the above-mentioned sense, economic development (with a high specialization of the labour force) needs to reduce morbidity, avoid epidemics by effective treatment or prevention and return labour to the labour force as quickly as possible. The initial theoretical concept is endogenous growth (Romer, 1986, Lucas, 1988), because it is generated by forces within the economy. The beginnings of this theoretical concept date back to the 1980s as a response to controversial impacts of Solow's traditional neoclassical growth model. The essence lies in technological progress in the form of improving its determinants, which are physical and human capital (Wawrosz & Valenčík, 2014).

The application of the method of synthesis of the theoretical concept of endogenous growth with Grossman's investing in health model (Becker, 1975) and Becker's concept of human capital (Becker, 1997) can provide important arguments supporting the principle of investing in health as a factor of economic growth and prosperity education.

3.5 HEALTH LITERACY AS A COMBINATION OF HEALTH AND EDUCATION POLICY AND MIX OF INVESTMENT IN HUMAN CAPITAL

In the context of monitoring the economic aspects of health literacy in human capital formation, two approaches to human capital can be applied, both microeconomic and macroeconomic. With the microeconomic approach, three types of human capital acquired during lifetime can be distinguished: initial human capital created in the family, human capital gained through study and human capital

gained during working life. Since the 1960s, human capital has also been studied from a macroeconomic point of view in connection with the application of growth accounting techniques to analysing the impact of education and human capital on economic growth. All theoretical concepts of human capital regard education as its basis. The basis for this is the educational system, which is an integral part of the health literacy of the population. Its determinants are a mix of public policies with national and regional competences, appropriate engagement of civil society and corporate cultures, with appropriate support from the state in the form of applied fiscal policy (Rivera & Currais, 1999).

The economy of health is a relatively young discipline. Although the issues it dealt with existed, of course, prior to its formation, an article in the American Economics Review, 1963, written by the American economist and Nobel Prize winner in economics Kenneth Joseph Arrow under the title "Uncertainty and the Welfare Economics of Medical Care" is considered to be a fundamental and constitutive work (Arrow, 1963). Approximately 11 years later, in 1974, the term health literacy by Scott Simond was first used in Health Education as Social Policy (Ratzan, 2001). This is described as a health education that meets the minimum standards for all levels of education. The importance of health literacy is that it helps people improve their health (by becoming familiar with the principles of healthy lifestyles and strengthening personal responsibility) and increasr the overall health status of the population, whereas low health literacy can lead to increased health risks, economic losses or health disparities status among social classes.

According to Don Nutbeam's model, there are three levels of health literacy: functional, interactive and critical (Nutbeam, 2000). Functional health literacy concerns the outcome of traditional health education, provides information on health risks and how to behave in the health system. The aim is to broaden and deepen people's knowledge of health risk factors and motivate them to willingly take the prescribed measures. This includes, for example, participation in vaccination, adherence to the schedule of preventive examinations. The aim of interactive health literacy is to develop citizens' ability to act independently, in particular to strengthen their motivation and responsibility while respecting health guidelines. It is not just obedience and effort to meet all the well-considered counsel of health professionals, but to develop self-identity and autonomy in decision-ma-

king, to strengthen internal motivation to help improve health (Holčík, 2010). At the same time, active citizenship is anticipated, where people become equal partners with health professionals and are motivated to strengthen and protect their health (Zvírotský, 2007). These include the activities of self-help groups of patients. Critical health literacy represents the highest level of health literacy, develops in individuals such abilities as their individual behaviour and socially and politically oriented activities, whose purpose is to contribute to the creation of a favourable health and social environment (Holčík, 2010).

The interdisciplinary approach of social, humanities and medical sciences is a tool for the promotion of all forms of prevention (primordial, primary, secondary and tertiary) that contribute to the sustainable development of humanity and the quality of life. The essence of prevention is the notion that it will be possible to reduce the incidence of diseases and injuries by actively influencing risk factors. An economic analysis of the cost of treatment of illnesses, on the one hand, and the costs of prevention, particularly through the implementation of health literacy programmes, on the other, clearly confirm the success of prevention.

For the reasons outlined above, health literacy, as part of preventive activities, can be seen as one of the basic inputs to health. This should not be understood merely as an expression of the realization of humanistic ideals and social aspects related to health care, but also as an interest in increasing the stock of available human capital in the most effective way, both in terms of macroeconomic and microeconomic growth – a particular person striving to maximize the benefits for their life.

The results of current empirical studies developed by applying quantitative methods in healthcare define dependence on growth rates and life expectancy: an advantage of five years of average life expectancy in a given country will affect the annual growth rate of gross domestic product by 0.3–0.5% (Bloom, Canning & Sevilla, 2001). According to Bloom, raising the average life of the population by one year leads to a cumulative increase in gross domestic product by up to 4% in the long run (Bloom & Rosenberg, 2007). Other studies (Bloom & Rosenberg, 2007), which confirm the positive correlation between investment in health and economic growth, identify the causal link leading to a shift from education and health to economic growth, leading to recommendations to invest in these

sectors, which is supported by empirical studies that show a positive correlation between the level of population health and economic growth in developed economies (Suhrcke, McKee, Arce, Tsolova & Mortensen, 2005).

4 CONCLUSION

At present, socio-economic analyses include concepts such as sustainable development, society's well-being, living standards, the quality of life or the education of society as well as the need to change the educational system or address the gradual ageing of the population and its impacts on the health, social and economic system. In most of these analyses, account needs to be taken of changes in human capital. This is confirmed by the attitude of public policies (especially social and regional), which, based on the theoretical concepts of the interested disciplines, are oriented towards the human dimension. This trend has accelerated in recent years. A significant part of this is also important in the field of health literacy, which, as one of the factors of quantitative and qualitative aspects of human capital, contributes to the creation of economic growth.

For the above reasons, it is a matter of public interest to develop health literacy with a priority to prevent the emergence of diseases and injuries in modern civilization. Therefore, this form of literacy can be characterized as an integral part of the health culture and social skills of the population. It is in public interest to enhance the importance of increasing health literacy of the population from basic education (Marádová, 2014). In connection with the expected evolution of ageing of the population, health literacy is at the forefront of the social issues of gerontology. Thus, the state administration and self-government bodies are tasked with creating support for the development of educational programmmes in school institutions and civil society.

REFERENCES

ABEL, T. (2013). *Health Literacy*. The Solid Facts. World Health Organization.
ARROW, K. J. (1963). *Uncertainty and the Welfare Economics of Medical Care.* American Economic Review, 53(5), pp. 941–973.
BECK, U. (2007). *Policy Invention: The Reflexive Modernization Theory*. Praha: Sociologické nakladatelství.
BECKER, G. S. (1997). *The theory of preferences.* Praha: Liberální institut, Grada Publishing.
BECKER, G. S. (1975). *Human capital: A theoretical and empirical analysis with special reference to education*. Second edition. Chicago and London: The University of Chicago Press.
BLOOM, D., CANNING, D. & SEVILLA, J. (2001). *The effect of health on economic growth: theory and evidence*. Social Science and Medicine 25(5), pp. 485–489.
BLOOM, D. & ROSENBERG, L. (2007). *How to pay for health.* Health newspaper. Available at: http://zdn.cz/scripts/detail.php?id=318147
BOURDIEU, P. (1986). *The Forms of Capital.* New York: Greenwood.
BRINKLEY, G. (2001). *The macroeconomic impact on improving health: investigating the causal direction*. Available at: http://trc.ucdavis.edu/glbrinkley/docs/causal.pdf
GROSSMAN, M. (1972). *On the Concept of Health Capital and the Demand for Health*. Journal of Political Economy, pp. 223-255. Vol. 80, No. 2.
HOLČÍK, J. (2010). *Health care and health literacy system*. 1st edition. Brno: Masarykova univerzita.
LUCAS, R. E. (1988). *On the Mechanics of Economic Development*. Journal of Monetary Economics, pp. 3–39. Vol. 22.
LUHMANN, N. (1984). *Social Systems: Outline of a General Theory.* Frankfurt am Main: Suhrkamp.
MARÁDOVÁ, E. (2014). *Selected chapters from didactics of health education.* Praha: Univerzita Karlova. Pedagogická fakulta.
NUTBEAM, D. (2000). *Health literacy as a public health goal: a challenge for contemporary health education and communication strategies into the 21st century.* Health Promotion International. Available at: http://heapro.oxfordjournals.org/

content/15/3/259.full.pdf
RATZAN, S. C. (2001). *Health literacy: communication for the public good.* Health Promotion International. Available at: http://heapro.oxfordjournals.org/content/16/2/207.full
RIVERA, B. & CURRAIS, L. (1999). *Economic Growth and Health*. Applied Economic Letters, pp. 761–764. No 6.
ROMER, P. M. (1986). *Increasing Returns and Long-Run Growth*. Journal of Political Economy, pp. 1002–1037. Vol. 94, No. 5.
SUHRCKE, M., MCKEE, M., ARCE, R., TSOLOVA, S. & MORTENSEN, J. (2005). *The contribution of health to the economy in the European Union*. Health and consumer protection directorate-general. Brussels: European communities.
WAWROSZ, P. & VALENČIK, R. (2014). How to Describe Affinities in Redistribution Systems.*18th International Conference Current Trends in Public Sector Research*. Praha. Czech Republic, pp. 212–220.
ZVÍROTSKÝ, M. (2007). *Illiterate about their own health.* Psychology today, pp. 32–38. Praha: Portál, s.r.o.

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WHAT BARRIERS PREVENT SOCIAL ENTERPRISES FROM IMPLEMENTING INNOVATION?

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ABSTRACT

Social entrepreneurship is characterised by a high degree of creativity and innovation, not only in technical terms but also in relation to management-social aspects. Social innovation is essential for the economic and social development of society. Social innovation is a relatively old phenomenon, but it has been brought to the forefront of attention and discussion only in recent years. In the Czech Republic, the implementation of social innovation is supported by projects from the European Social Fund, as well as the development of social enterprises. Social enterprises are nowadays regarded as some of the most typical representatives of social innovation. The aim of the paper is to answer the question about what prevents social enterprises from making changes that are innovative. If companies make changes, what are the main reasons for innovation and the benefits of these innovations for social enterprises? The survey was carried out on a sample of social enterprises in the Czech Republic and Slovakia. The questionnaire survey showed that social enterprises are forced to innovate in order to maintain their competitiveness on the market while retaining the interest of their customers. It is obvious that in the Czech Republic the government conception of social entrepreneurship and legislative definition of the social business that would direct the formation and development of social businesses in the long-term are missing.

Keywords: *ocial economy, social entrepreneurship, social innovation, competitiveness*

JEL Classification: D64, H43, O22

1 INTRODUCTION

The urgency of structural unemployment, social policy issues and the need for more active integration policies result in the question and need to establish suitable structures, that might, in certain areas, take these socio-economic issues over from the public administration. One of the possible alternatives is to address the issues related to social economy through social enterprises that provide alternative and complementary options to addressing these issues. The concept of social entrepreneurship has been adopted by some EU countries; nevertheless, this concept has not been socially recognised everywhere. This concerns not just recognition of the enterprise but also recognition in the form of support, regulation and legislation by public authorities.

The importance of the third sector and its differentiation from the private and public sectors has grown significantly in recent years. Its economic significance is associated primarily with productivity, and employment and growth can also be observed in the services sector. The importance of the third sector in the countries of Central and Eastern Europe is underestimated. In contrast, in developed countries, such as France, Belgium and Ireland, the social economy contributes to 10% of employment (Defourny, Pestoff, 2008).

Social economy and social entrepreneurship do not bring about innovation associated with ownership of companies. Social economy emphasises responsibility of social enterprise owners related to changes in society by introducing innovation in the field of new products and their quality, new methods of organisation and production, new production factors and relationships in the market and new forms of enterprises and entrepreneurship (Defourny, Hulgard, Pestoff, 2014).

The values and starting points for social economy and social entrepreneurship are inspired by the ideas of solidarity and humanism advocated by Owen and King, Leon Walras and John Stuart Mill (Defourny, Develtere, Fonteneau, 1999). Contemporary economists include, for example, Jacques Defourny, Jean-Louis Laville and others who combine the ideas of social, solidarity, ethical or humane economy and thus emphasise the importance of local social enterprises and social entrepreneurship (Dohnalová, Deverová, Šloufová, 2012).

1.1 SOCIAL ENTERPRISE – BEARERS OF SOCIAL INNOVATION

The Danish Technological Institute (DTI), which is actively involved in social innovation, defines social business as "*a business with primarily social objectives where economic profit is primarily reinvested in the business for the same purpose or in the development of the local community and therefore is not intended to maximise profits for owners and shareholders*" (Danish Technology Institute, 2002).

Social enterprises try to meet the local needs using local sources, they enter into local partnership initiatives and contribute to local development. (Komora sociálních podniků, 2016).

A key objective of social entrepreneurship is the inclusion of disadvantaged people in the labour market and the resulting reduction in the dependence of people on state unemployment benefits. The state supports these social enterprises at the start of their activities and, tries to facilitate their establishment and further development of the enterprises. The social enterprise means an enterprise where people are recruited from target groups: "It is built upon a partnership of public and private social sectors while providing public services and promoting public employment policy" (Hunčová, 2007). A social enterprise is very exceptional since both these sectors work closely together here, and it can be understood as an executor of social policy. A social enterprise is supported by public (including EU) funding. Despite this funding, it remains an independent social enterprise and its decisions on business operations do not involve anyone from the outside.

Social enterprises are bearers of social innovation. The European Commission defines social innovation as follows: "*Social innovation can be defined as the development and implementation of new ideas (products, services and models) to meet social needs and create new social relationships or collaborations. It represents new response to pressing social demands, which affect the process of social interactions. It is aimed at improving human well-being. Social innovations are innovations that are social in both their ends and their means. They are innovations that are not only good for society but also enhance individual's capacity to act*"(Navrátil, Placier, 2016).

Social innovation is essential for the economic and social development of society. From the understanding of innovation as the ability to improve performance, diversity and the development of new products within the business environment,

society is moving towards understanding innovation in a wider context. Kadeřábková, Saman (2013) suggest that the current approach focuses on and emphasizes further innovation in research and development as well as social aspects, networking, innovation in services, creative industries, public sector etc

Social innovation merges into all parts of the public sector: education, health, social services, employment of disadvantaged people in the labour market, family policy. It does not necessarily have the character of a particular product or service. Companies and non-profit organizations usually create new, functioning social organizations through social innovation, but we cannot omit the influence of government-created organizations. The innovative capacity of organizations grows largely where cooperation between all three sectors (commercial sector, non-profit sector, government), exchange of experience and shared funding are facilitated.

Despite the current popularity and fashionability of the term in the media, social innovation has no exact definition. The opinions of the authors differ, especially in different countries, as social innovations in practice and the issues associated with them are shaped differently depending on the country, and social needs vary in the context of each individual or community.

Caulier-Grice, Patrick, Norman (2012) refer to social innovation as multidisciplinary as it is at the crossroads of various disciplines such as economics, public administration and public policy, business management.

2 MATERIAL AND METHODS

The aim of the paper is to answer the question about what prevents social enterprises from making changes that are innovative. If companies make changes, what are the main reasons for innovation and the benefits of these innovations for social enterprises?

In the Czech Republic there are 222 subjects: identified as social enterprises (indicator as of 23 September, 2018). This list can be found in the database of Czech Social Business administered by TESSEA and P3: People, Planet, Profit (České sociální podnikání, 2018). Due to the fact that it is voluntary for social enterprises to get registered in the database, the data is not statistically relevant. Still, we can say that the number of social enterprises is growing, which is caused

by the transformation of current businesses into social enterprises, the transformation of NGOs into social enterprises and the establishment of new social enterprises.

For her research, the author chose social enterprises not only in this country but also in the Slovak Republic. Slovakia was selected primarily to compare whether different approaches and legislation in another country actually have an impact on the development of social innovations in social enterprises.

Currently, seven social enterprises are registered in Slovakia all registered businesses were contacted for research purposes. These social enterprises in Slovakia are mainly located in small and medium regions of up to 12,500 inhabitants. For this reason, regions with a comparable population size were selected for research in the Czech Republic. These smaller regions are predicted to have higher levels of poverty and social exclusion. They were selected for the Czech Republic, which in the end represented a comparable number of inhabitants of Slovakia. In this way, approximately the same value was obtained from the demographic point of view. Of the 104 social enterprises (which were generated from the selected regions for comparison), 33 enterprises fulfilled the prerequisite for operating in small and medium-sized region.

The survey was carried out by a quantitative survey through a standardized questionnaire in August 2017, and it was compiled by the author. The questionnaire contained some open questions, but most of the questions were closed with the choice of answers, and if a respondent did not choose any of the answers, they could answer another answer. The questionnaire survey was executed in two rounds because the rate of return in the first round was only 17.5%. In case of non-responding companies, telephone interviews were also conducted. After the second round, the rate of return increased to 52.5%. The big issue in the survey is that the email addresses on the website were not up to date or belonged to employees in the company who did not feel sufficiently competent in terms of the job position to complete the questionnaire.

3 RESULTS AND DISCUSSION

Through social innovations, social enterprises respond to the requirements of unsatisfied social needs, work on sustainable growth, emphasize social cohesion, generate inclusive growth by providing goods and services in an entrepreneurial and innovative way to achieve social goals (priority is not given to achieving own profit). It can be argued that the purpose of their existence is to create economic and social changes that, among other things, contribute to the Europe 2020 strategy (European Commission, Social Business Initiative, 2011).

The questionnaire survey was attended by 21 companies, including 7 Slovak companies. The questionnaire survey showed that 17 enterprises were involved in social innovation, five social enterprises responded negatively. At the same time, these respondents stated that they have been doing social innovation for the last two years. These respondents were also asked what kind of innovation they are introducing in their social enterprise. The questionnaire survey shows that up to 65% of social enterprises are dedicated to innovation in organizational structure, 56% of enterprises are dedicated to innovation in their products, 41% to innovation in business management, and 41% to manufacturing innovations. The table below shows that 29% of respondents stated that they are introducing technology innovations and only 6% devoted to innovation in the services provided.

Tab. 1 » Types of innovation introduced by social enterprises

Types of innovation	Number of responses	% share
Product innovation	10	56 %
Innovation in manufacturing processes	7	41 %
Technology innovation	5	29 %
Innovation of organizational structure of the company	11	65 %
Innovation in management	7	41 %
Innovation in services provided	1	6 %

Source: own processing

3.1 THE MAIN REASONS FOR THE DEVELOPMENT AND INNOVATION

The reason for innovation in an enterprise should not concern only profit-making but also an increase in the efficiency of available resources in an enterprise, be it human capital or financial capital, improved workflow, strengthened social capital in the region thanks to expanding cooperation and contacts. At the same time, it should also include job sustainability. The spread of social innovation through social entrepreneurship focuses on providing innovative solutions to outstanding issues, value creation, and social entrepreneurship and social innovation (Social Entrepreneurship and Social Innovation, 2010). There are many reasons why social enterprises are engaged in social innovation. For some social businesses, it is a means of maintaining the market. Another issue in the research focused on the main reasons for social innovation.

Tab. 2 » The main reasons for social innovation in a social enterprise

The main reason for innovation	Number of responses	% share
The need for market	3	18 %
Financial grant	2	12 %
Maintaining our own competitiveness	13	76 %
Maintaining jobs	1	6 %
Improving the quality of the services provided	1	6 %
Expansion of activities into new areas	1	6 %

Source: own processing

The questionnaire survey shows that up to 76% of all respondents replied that they are innovating to maintain their own market competitiveness. This corresponds to the response of 12% of respondents that the main reason for innovation is the need for market. Two social enterprises have been innovating because of a grant. Only individual responses from social enterprises have listed reasons for social innovation to maintain jobs, improve the quality of services provided and expand their activities to new areas.

3.2 BENEFITS OF INNOVATION

Innovation of business entities brings about positive changes in certain forms. These benefits for the enterprise may include, for example, development of new products, increased labour productivity, increased company turnover, increased competitiveness, reduced costs or increased profit. Every enterprise that is engaged in social innovation should be able to identify the effect of introducing social innovation into the process. In the framework of the questionnaire survey, we investigated the benefits of implementing social innovation for a particular social enterprise.

Tab. 3 » Benefits of innovation for the social enterprise

Answers	Numbers of responses	% share
Development of new products	3	17 %
Increasing labour productivity	1	6 %
Increase in company turnover	2	11 %
Growth of competitiveness	11	61 %
Increase in profit	0	0 %
Cost reduction	3	17 %

Source: own processing

The responses show that social enterprises see the growth of competitiveness on the market as the main reason for innovation and that other companies have developed new products and reduced production costs. Only two companies said that thanks to innovation, they increased the turnover of the company and one enterprise increased labour productivity.

If we also take into account innovation, social enterprises are looking for customers, and they are inspired by cooperating companies as well as competitors. Few companies are inspired by their own ideas and their own needs, only one surveyed company is looking for incentives to innovate in foreign literature.

As a reason for introducing social innovation, businesses primarily address local solutions and civil society development, expand existing activities, and increase employment.

3.3 IMPORTANCE OF SOCIAL INNOVATION FOR SOCIAL ENTERPRISES

Social enterprises are nowadays considered typical representatives of social innovation. What is their main difference from private sector business? Social enterprises, when carrying out their activities, focus on the social benefits they can create on the basis of social innovation. It is just the creation of social benefits and the innovative approach that is a major difference between social entrepreneurship and other forms of business in the public or private sector.

What is the goal of social enterprises following the introduction of social innovation? The questionnaire survey shows that social enterprises, as business entities, are seeking to gain financial independence, which is based on the introduction of innovations into their business activity. Social enterprises have indicated their own competitive edge as the main reason for introducing innovation. Companies try to keep up with their competitors while keeping their customers' interests in mind. And that cannot be achieved without innovation. Competitiveness is based on the entrepreneurial use of unique local specifics, meeting customer needs, creating products and services that are tailor-made to customer requirements and creating value for a product or service and engaging disadvantaged people in the process. (Lubelcová G. et al., 2011).

What types of innovation do social enterprises mostly focus on? The research shows that most social enterprises focus on product innovation and innovation in the organizational structure of the enterprise. Other innovation activities include innovation in management, innovation of manufacturing processes, technology and innovation in the provided services. It is precisely the introduction of innovative practices that promises social enterprises better results than the current way of functioning. Indeed, after the introduction of social innovations, has the situation of social enterprises improved in the market?

Based on the research, we can conclude that social innovation has a positive impact on the functioning of a social enterprise. Most businesses consider it an essential prerequisite for the development of their business. Social enterprises consider the growth of competitiveness, reduction of costs, the development of new products and increased turnover of the company as the main benefits of social innovation. In social innovation, social enterprises are not the driving force. Who or what is the

main initiator for implementing social innovation in an enterprise? The answers to the questionnaire survey show that the main source of ideas and requirements for innovation are the customers themselves who, by their unfulfilled needs, create a market space for manufacturers and distributors to create new or improve the existing products and services. Social enterprises consider market sources, cooperating firms and competitors as the initiator of innovation.

4 CONCLUSION

The paper aimed to answer the question about what prevents social enterprises from making changes that are innovative. If companies make changes, what are the main reasons for innovation and the benefits of these innovations for social enterprises? The results of the research have confirmed that social enterprises place emphasis on innovation, especially by innovating their internal organizational structure and products. The main reasons for innovation have been for companies to maintain their competitiveness in the market. Social enterprises are aware that the decision to introduce innovation does not always guarantee success in the innovation activity.

Social enterprises are making changes and want to continue to do so. So what are the barriers to social innovation? There is no legislative and systemic framework in place for social entrepreneurship in the Czech Republic. Social enterprises feel the lack of cooperation with the public sector. Social enterprises do not receive support in public processes (socially responsible public procurement). What is also missing is a systematic setup of financial support for social enterprises (soft loans, credits).

The research has been carried out only on a number of social enterprises operating in the Czech Republic. However, it can be inferred from the results that innovation is a key element in maintaining the market and other social enterprises. In Slovakia, research has been carried out on all existing social enterprises and it is clear from the results that the responses in both countries do not differ significantly. Social businesses address the same challenges and try to keep up with market innovation. Based on the research, we can conclude that social innovation has a positive impact on the functioning of a social enterprise. Most businesses consider it an inevitable condition for the development of their business. Social

businesses consider the growth in competitiveness, cost reduction, new product development and increased turnover as the main benefits of social innovation. It is therefore necessary to incorporate collaboration with local social enterprises into local strategies, take this initiative to the level of cooperation with the public sector (e.g., by creating social incubators and platforms) and encourage this type of local business (e.g., by awarding socially responsible contracts).

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REFERENCES

CAULIER-GRICE, J., DAVIS A., PATRICK, R. & NORMAN W. (2012). Defining Social Innovation. [online] Brussels: European commission, DG Research. The theoretical, empirical and policy foundations for building social innovation in Europe (TEPSIE). Available at: http://siresearch.eu/sites/default/files/

ČESKÉ SOCIÁLNÍ PODNIKÁNÍ. (2018). Adresář sociálních podniků. [online]. Available at: http: //www.ceske-socialni-podnikani.cz/cz/adresar-socialnich--podniku

DANISH TECHNOLOGY INSTITUTE (DTI). (2002). Social enterprise, a strategy for success. 2002 [online]. Department of Trade and Industry. Available at: http://webarchive.nationalarchives.gov.uk/20070108124358/http:/cabinetoffice.gov.uk/third_sector/documents/social_enterprise/se_strategy_2002.pdf

DEFOURNY, J., DEVELTERE, P. & FONTENEAU, B. (Eds.). (1999). *L'économie sociale au Nord et au Sud.* Brussels: De Boeck Université

DEFOURNY, J., HULGARD, L. & PESTOFF, V.(2014). *Social Enterprise and the Third Sector. Changing European Landscapes in a Comparative Perspective.* London and New York: Routledge

DEFOURNY, J. & PESTOFF, V. (Eds.). (2008). *Images and Concepts of the Third Sector in Europe.* Working papers series, No. 08/02 [online]. Liege: EMES European Research Network 2008. Available at http://orbi.ulg.ac.be/bitstream/2268/10247/1/WP08%2002%20images%20%26%20concepts%20of%20the%20third%20sector%20in%20Europe.pdf

DOHNALOVÁ, M., DEVEROVÁ, L. & ŠLOUFOVÁ, R. (2012). *Sociální ekonomika, sociální podnikání. Podnikání pro každého.* Praha: Wolters Kluwer.
EUROPEAN COMMISSION, SOCIAL BUSINESS INITIATIVE. (2011). Oznámení komise evropskému parlamentu, radě evropskému hospodářskému a sociálnímu výboru a výboru regionů. [online]. Available at:https://www.employment.gov.sk/files/slovensky/ministerstvo/medzinarodna-spolupraca/europska-unia/strategie-europskej-unie/kom_2011_682.pdf
HUNČOVÁ, M. (2007). *Sociální ekonomika a sociální podnik*. Ústí nad Labem: Univerzita Jana Evangelisty Purkyně.
10. KADEŘÁBKOVÁ, A. & SAMAN, S.M. (2013). Příručka pro tvorbu a realizaci inovačních projektů [online]. 2013. 56 pages. Available at: https//www.esfcr.cz/file/8646
KOMORA SOCIÁLNÍCH PODNIKŮ. (2016). Osoby znevýhodněné na trhu práce. Available at: http://komora-socialnich-podniku.cz/?page_id?151
LUBELCOVÁ, G. a kol. (2011). *Inovácie v sociálnych a verejných politikách: problémy konceptualizácie a nových nástrojov.* UK: Bratislava, 2011. ISBN 978-80-223-3043-5.
NAVRÁTIL, J. & PLACIER, K. (2016). Social innovation Types in Consumer Protection in Alternative Financial Services after the Great Recession. In Špalková, D. & Matějová, L. (Eds.) *Current Trends in Public Sector Research.* Proceedings of the 20th International Conference. 20. vyd. Brno: Masaryk University, 2016. pp. 336–343.
SOCIAL ENTERPRENEURSHIP AND SOCIAL INNOVATION. (2010). Social Entrepreneurship and Social Innovation, chapter 5, pp. 185–215, [online] Available at: http://ec.europa.eu/internal_market/social_business/docs/conference/oecd_en.pdf

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PUBLIC R&D EXPENDITURE EFFICIENCY AND KNOWLEDGE CREATION IN THE CEE REGION

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ABSTRACT

In this paper we use the data envelopment analysis (DEA) to analyze the efficiency of public expenditure on R&D in Central and Eastern European countries (CEE), using knowledge creation and knowledge diffusion as key output indicators. Our results show that most CEE countries do not use public R&D resources efficiently and that the current level of expenditure should generate much better results on the Global Innovation Index scale. Thus, we believe that instead of increasing the level of public expenditure on R&D, the CEE countries need to increase efficiency first. In order to do so, these countries should continue to improve their institutional framework in terms of government effectiveness, business climate and suppression of corruption. The increase in R&D efficiency is of great importance for the CEE countries as they look for new knowledge-based growth models that are more challenging for policy makers than pre-crisis models, which were based on physical capital accumulation and adoption of technologies from abroad.

Keywords: *R&D, public sector, knowledge creation, DEA, CEE*

JEL Classification: O43, O34, O38

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1 INTRODUCTION

According to Todaro and Smith (2014), there are three fundamental sources of economic growth: (i) capital accumulation, including all new investments in land, physical equipment and human resources through improvements in health, education and job skills; (ii) growth in population and hence eventual growth in the labour force; and (iii) technological progress – new ways of accomplishing tasks. In this paper we will focus on the latter growth factor as the contribution of technological progress to economic growth is becoming even more pronounced in the new digital era.

The importance of technological progress was already recognized in a pioneer work by Solow (1956) within the neoclassical analytical framework. In these models, technological change is exogenous, it comes as *manna from heaven*, and it determines the long-run growth rate of countries through the effects on long--run productivity. Although these models were a breakthrough in the economic development and growth theory, they failed to "internalise" the technological progress.

The situation changed in 1990 after Paul Romer published his seminal paper on endogenous technological change (Romer, 1990). In this paper, Romer did not challenge Solow's main conclusions. Indeed, in his view technological change provides the incentive for continued capital accumulation and, together, capital accumulation and technological change account for much of the increase in output per hour worked. However, Romer went a step further and explained that technological change arises in large part as a result of intentional actions taken by people who respond to market incentives and invest in research and development (R&D). In this sense, technological progress in his model is endogenous rather than exogenous.

However, the level of R&D expenditure *per se* cannot ensure adequate private or social returns on investments in an economy. More precisely, if R&D resources are not used efficiently (we use the term efficient in terms of technical efficiency), they cannot generate adequate output needed for sustainable technological progress. Thus, in this paper we will analyze not just the levels of R&D expenditure but also the efficiency of this expenditure in the CEE region. Our focus is on

public expenditure on R&D as we are interested in the public policy perspective of this topic.

In order to determine the efficiency of public expenditure on R&D, we use the data envelopment analysis (DEA) approach. The key input in our analysis is the total size of the government budget appropriations or outlays on R&D. The novelty of this paper lies in the chosen outputs as we do not use usual outputs such as the number of patents or the number of published scientific papers but the results of the Global Innovation Report, which in our view contains more information on knowledge-creation – the key prerequisite for technological progress in some countries. Our main hypothesis is that most CEE countries do not use public R&D resources efficiently.

The paper is structured as follows. The Introduction is the first part of the paper; in the second part we present a brief overview of the existing literature, with the focus on papers using the DEA approach. In the third part of the paper we briefly explain the methodology, i.e. the data envelopment analysis, while in the fourth part we describe and analyze the data used in the model. In the fifth part of the paper we discuss the results and the last part of the paper contains conclusions and policy recommendations.

2 LITERATURE REVIEW

Werner and Souder (1997) divided the research on R&D effectiveness and efficiency into two categories: macro and micro. Macro-level techniques focus on the impact of R&D on society as a whole. Micro-level techniques focus on the impact of a firm's R&D on its own effectiveness.

In this paper we focus on the macro-level approach, cross-country comparisons and papers based on the DEA analysis. This literature is relatively scarce. Although Teitel (1994) did not use DEA, this paper is worth mentioning as it represents one of the benchmark papers in this field. The author showed that investment in R&D can result in an increase of patents and improve scientific results in various countries. This finding motivated future research on R&D expenditure efficiency. Rousseau and Rousseau (1997) and Rousseau and Rousseau (1998) used DEA in the analysis of R&D expenditure efficiency in developed countries. They showed that there is a huge difference in efficiency across countries, meaning that even

highly developed countries can position below the technological frontier. Based on the DEA approach, Lee and Park (2005) analyzed R&D efficiency in twenty--seven mostly developed countries, and based on the results divided the countries into four categories: inventors (Finland, France, Germany, Japan and the United States), merchandisers (Austria, Ireland, Norway and Singapore), academics (Australia, Canada, Hungary, Italy, New Zealand, Spain and the United Kingdom) and duds (China, the Czech Republic, Korea, Mexico, Poland, Portugal, Romania, the Russian Federation, Slovakia, Slovenia and Taiwan). Wang and Huang (2007) analyzed R&D efficiency in thirty OECD and non-OECD countries also taking into account environmental factors such as knowledge of the English language. They found that a large portion of the inefficiency can be explained by a country's English proficiency indicator. Sharma and Thomas (2008) used DEA to examine the relative efficiency of the R&D process across a group of twenty-two developed and developing countries and documented a relatively high level of inefficiency in the R&D resource usage in both groups. Thomas, Jain and Sharma (2009) analyzed R&D expenditure efficiency in twenty OECD countries, China and the Russian Federation. The authors concluded that Asian countries have shown remarkable progress in R&D efficiency which seems to be at the cost of the leading nations like the USA and the UK. As for the Asian countries, authors show that China exhibits a rapid increase in the number of scientific publications, while the Republic of Korea shows exemplary performance in patenting among residents. Cincera, Czarnitzki and Thorwarth (2011) analyzed the efficiency of R&D in OECD and EU countries. The results show that the most efficient countries in terms of R&D public support are Australia, Canada, Finland, Germany, Japan, the Netherlands, New Zealand, Singapore, Switzerland and the USA.

The research that is the closest to ours is Aristovnik (2012). Based on the DEA methodology, the author measured the relative efficiency in utilising public education and R&D expenditure in the new EU member states in comparison to the selected EU and OECD countries. Results showed that Cyprus and Hungary dominated in the field of R&D. The empirical results also showed that, in general, the new EU member states show relatively high efficiency in tertiary education, while lagging well behind in R&D efficiency measures.

3 METHODOLOGY

As mentioned in the Introduction, in this paper we will use data envelopment analysis to determine the technical efficiency of public R&D expenditure.

In order to better explain why we use this type of efficiency measure, we have to remind that there are two main measures of efficiency in economics – allocative and technical efficiency. Allocative efficiency refers to how the different resource inputs are combined to produce a mix of different outputs. Technical efficiency, on the other hand, is concerned with achieving maximum outputs with the least cost. The focus of this paper is on the latter type as we are interested in a rational use of public resources.

The data envelopment analysis (DEA) is a deterministic, non-parametric, linear programming technique for the determination of so-called efficiency scores. DEA scores reflect the distance between the respective data point, in this paper a country, and the best practice point which lies at the frontier. The countries (data points) on the frontier are given a score of 1, while those inside the frontier are given a score between 0 and 1. DEA provides a measure of relative efficiency, meaning that it indicates that a country is the more efficient relative to the other countries in the sample.

DEA can be input-oriented or output-oriented. The input-oriented method shows by how much input quantities can be proportionally reduced without changing the output quantities produced. On the other hand, output-oriented methods are focused on the question by how much output quantities can be proportionally expanded without altering the quantities of inputs used (for details see Coelli, 1996). At the same time, DEA can be based on the assumption of constant returns to scale (CRS) or variable returns to scale (VRS). In this paper we use the output-oriented VRS approach as the objective of R&D policies lies in increasing the outputs rather than decreasing the inputs (Lee and Park, 2005). DEA linear program is defined as:

$$min \sum_{i=1}^{m} v_i x_{ik} \tag{1}$$

$$s.\ t.\ \sum_{r=1}^{s} u_r y_{rk} = 1 \tag{2}$$

$$\sum_{r=1}^{s} u_r y_{rk} - \sum_{i=1}^{m} y_{rj} x_{ij} \leq 0, j = 1,\ldots, n \tag{3}$$

$$u_r \geq \varepsilon,\ r = 1,\ldots, s$$
$$v_i \geq \varepsilon,\ i = 1,\ldots, m$$

x_{ij} is the amount of the *i-th* input, y_{rj} is the amount of the *r-th* output, v_i is the weight given to the *i-th* input, u_r is the weight given to the *r-th* output, and k is the decision-making unit, in our case a country, measured. The constraints avoid any inputs or outputs being weighted at 0.

4 DATA AND ANALYSIS

As noted above, we are interested in the efficiency of public expenditure on R&D, which represents the input in our DEA analysis. Although many research studies use data on the share of public sector R&D expenditure in GDP, we see this indicator as deficient as it strongly depends on the level of development of each country. Thus, in this paper we use an alternative indicator, namely the total size of government budget appropriations or outlays on R&D as a share of total government expenditure, obtained from the Eurostat database. The indicator defined in this way partially annuls the effects of the differences in the level of development among countries.

As for the outputs, in this paper we use data from the Global Innovation Index (GII) report as in our view complex indicators from this report provide a better insight into the quality of knowledge and technology outputs than the commonly used indicators such as the number of patents or published scientific papers across countries. Also, most of the indicators in this report are PPP-adjusted, which makes a cross-country analysis more robust. As main outputs we use two sub-categories of the GII pillar VI "Knowledge and Technology Outputs" – *Knowledge Creation and Knowledge Diffusion*" (for details see Dutta et al., 2017).

The *Knowledge Creation* indicator combines data on the number of resident patent applications filed at a given national or regional patent office (per billion PPP$ GDP); the number of international patent applications filed by residents at the Patent Cooperation Treaty (per billion PPP$ GDP); the number of utility model applications filed by residents at the national patent office (per billion PPP$ GDP); the number of scientific and technical journal articles (per billion PPP$ GDP).

The *Knowledge Diffusion* indicator includes data on charges for use of intellectual property n.i.e. receipts (%, total trade); high-tech net exports (% of total trade); telecommunications, computers and information services exports (% of total trade); foreign direct investment (FDI), net outflows (% of GDP, three-year average).

Our sample includes eleven EU countries from Central and Eastern Europe (CEE): Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia. The input is defined as the 2011–2016 average, while outputs represent GII scores in 2017. The use of "lagged" values of inputs is a standard approach in the DEA analysis as it takes time for inputs, in our case public expenditures on R&D, to provide results in terms of outputs. For detailed discussion on the use of average data see Graves and Langowitz (1996).

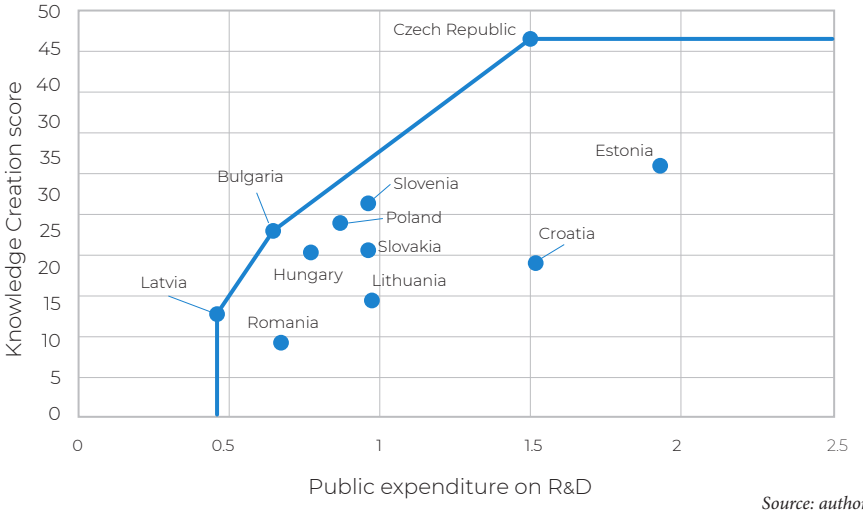
Tab. 1 » Inputs and outputs in the DEA model

	Definition	Source
Input	Government budget appropriations or outlays on R&D as % of total government expenditure	Eurostat
Outputs	Knowledge Creation score Knowledge Diffusion score	Global Innovation Index

Source: authors

The scatter diagrams in Figure 1 and Figure 2 present data in a way that allows for easy understanding of the DEA analysis background. X-axis contains data on the input and y-axis contains data on the output. The solid line "envelops" the sample by connecting countries that produce the maximum output at the given level of input.

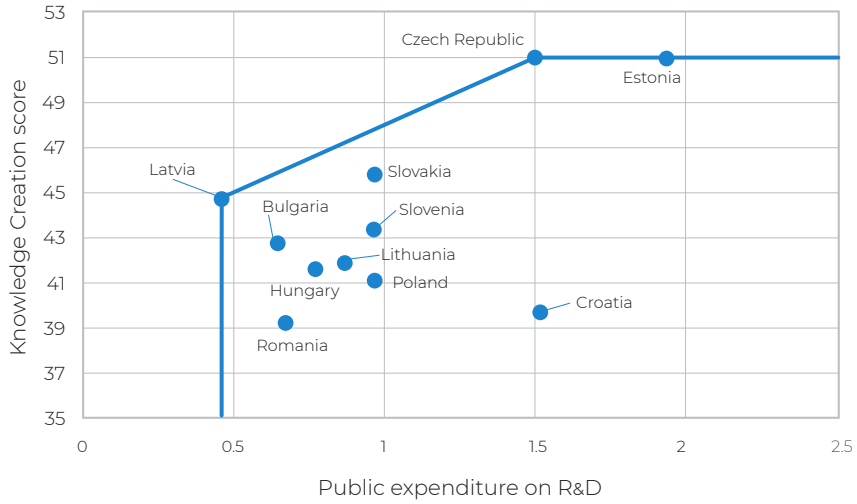
Fig. 1 » Government expenditure on R&D and the Knowledge Creation score



Source: authors

Figure 1 shows that Latvia, Bulgaria and the Czech Republic can be seen as the efficient units in this model as they lie on the efficiency frontier. Countries relatively close to the efficiency frontier include Hungary, Poland and Slovenia. Croatia is the worst performer in this sample as it is positioned deep inside the efficiency set.

Fig. 2 » Government expenditure on R&D and the Knowledge Diffusion score



Source: authors

Figure 2 leads to similar conclusions. The figure suggests that the Czech Republic and Latvia are efficient benchmarks also in the case of the Knowledge Creation score, while Bulgaria is now below, but close, to the efficiency frontier. Estonia takes the place of efficient benchmark from Bulgaria in this model. Apart from Bulgaria, Slovakia is also close to the efficiency frontier (since we are using the input method, the distance to the frontier can be read by measuring the distance between the country's position and the efficiency frontier to the left). Croatia is positioned well inside the efficiency set again, which implies that Croatia is the least efficient country.

These figures indicate that there is a high level of dispersion among the CEE countries in terms of R&D expenditure efficiency. In addition, these figures suggest that the Czech Republic and Latvia could be the regional leaders in this sense. It is also interesting to notice that the positions of countries are relatively stable regardless of which indicator we observe. In the next section, we will add more analytical rigour to this discussion by using the DEA model on the presented data.

5 RESULTS AND DISCUSSION

The tables presented below contain data on the DEA efficiency scores θ and so-called "target" outputs, which show by how much the output should increase to obtain efficiency if the input stays unaltered. The score for efficient countries takes the value of 1 and the countries which are below the "efficiency frontier" record scores in the interval of $0 < \theta < 1$.

Tab. 2 » DEA results for Knowledge Creation

	Efficiency score	Target output	Required increase of output
Bulgaria	**1**	**23.1**	**0**
Croatia	0.41	46.8	27.5
Czech Republic	**1**	**46.8**	**0**
Estonia	0.66	46.8	15.5
Hungary	0.72	28.3	8.0
Latvia	1	13.0	0
Lithuania	**0.43**	**33.6**	**19.0**
Poland	0.78	31.0	6.8
Romania	0.37	25.7	16.2
Slovenia	0.79	33.6	7.1
Slovakia	0.62	33.6	12.9

Source: authors

The results presented in Table 2 show that three countries determine the "efficiency frontier" for this sample – Bulgaria, the Czech Republic and Latvia. The efficiency scores for these countries equal 1. As these countries operate on the efficiency frontier, the size of their target output corresponds to the size of their real output, i.e. the required increase of output is 0. The least efficient countries include Romania, Croatia and Lithuania. Target outputs for these countries suggest that, given the level of expenditures on R&D, Romania should increase

its GII score by 16.2 points, Croatia by 27.5 points and Lithuania by 19 points. It should be noted that Croatia has a higher efficiency score than Romania but requires a stronger increase in output to become efficient. This is because these countries do not have the same peers. Peers for Romania are Latvia and Bulgaria, while for Croatia it is the Czech Republic.

Tab. 3 » DEA results for Knowledge Diffusion

	Efficiency score	Target output	Required increase of output
Bulgaria	0.94	45.72	2.92
Croatia	0.78	51.00	11.20
Czech Republic	**1.00**	**51.00**	**0**
Estonia	**1.00**	**51.00**	**0.10**
Hungary	0.90	46.53	4.83
Latvia	1.00	44.60	0
Lithuania	**0.86**	**47.76**	**6.56**
Poland	0.89	47.12	5.12
Romania	0.85	45.92	6.72
Slovenia	0.91	47.68	4.28
Slovakia	0.96	47.69	1.89

Source: authors

As for the results concerning *Knowledge Diffusion*, our model also recognizes three benchmarks, but in this case they are the Czech Republic, Latvia and Estonia. We see that the Czech Republic and Latvia are benchmark countries again. The interpretation follows the lines from Table 2, meaning that now the Czech Republic, Latvia and Estonia recorded efficiency scores of 1 and required increase of outputs of 0. The least efficient countries again include Croatia, Romania and Lithuania, but in this case Croatia is positioned last. The required output increase results show that Croatia would have to increase its GII score by 11.2 points, Romania by 6.7 points and Lithuania by 6.6 points. The peer for Croatia is now

Estonia and for the other two weak performers they are Latvia and the Czech Republic.

6 CONCLUSION

There is no doubt that public investment in R&D is an important part of a broader economic policy, especially in modern economies where technological progress, often expressed through the concept of total factor productivity (TFP), is becoming more important in the growth creation process. However, the size of the investment alone cannot ensure adequate social returns. It is important that public R&D expenditure should be used efficiently, meaning that for a given level of input it provides a maximum output. The efficiency of public expenditure is of great importance in the CEE region as a lot of countries have a history of fiscal unsustainability and were compelled to cut their budget spending during the period following the 2008 financial crisis.

The results presented in this paper confirm our working hypothesis that most CEE countries do not use public R&D resources efficiently, especially within the knowledge creation process. Such inefficiency can partially explain the relatively low ranking of CEE countries on the Global Innovation Index scale, where these countries are among the weakest performers in the European Union. This is alarming as literature on economic growth shows that as an economy's income rises, productivity growth fails to keep up, with countries finding it difficult to switch from a growth model based on investment and the adoption of technology to one involving innovation and the development of new technology. Most CEE countries are in the category of high income countries (based on the World Bank definition) and thus require a new, knowledge-based growth model. Therefore, we believe that instead of increasing the level of public expenditure on R&D, these countries need to increase efficiency first. In order to do so, the CEE countries should continue to improve their institutional framework in terms of government effectiveness, business climate and suppression of corruption (it is interesting to point out that the CEE countries are still ranked relatively low on the Corruption Perception Index scale and that Romania and Croatia, which were marked as the least efficient in this paper, have some of the lowest scores in CEE).

The main contribution of this paper is the use of inputs and outputs that have

not been used in the existing literature so far. As explained in the main body of the text, in our view these variables are more appropriate for the analysis than those which are most commonly used. In addition, this is the first paper that investigates the efficiency of R&D in terms of knowledge-creation and knowledge-diffusion in Central and Eastern Europe. In future research, the efficiency scores obtained from the DEA analysis in this paper can be used in a broader econometric analysis in which efficiency of public R&D expenditure could be regressed directly on the GDP growth rates in order to show that R&D efficiency is more important for long-term growth than the levels of expenditure per se.

REFERENCES

ARISTOVNIK, A., (2012). The relative efficiency of education and R&D expenditures in the new EU member states. *Journal of business economics and management*, Vol. 13, No.5, pp. 832–848. DOI: https://doi.org/10.3846/16111699.2011.620167

CINCERA, M., CZARNITZKI, D., & THORWARTH, S. (2011). Efficiency of public spending in support of R&D activities. *Reflets et perspectives de la vie économique*, Vol. 50, No. 1, pp.131–139. DOI: 10.3917/rpve.501.0131

COELLI, T. (1996). A guide to DEAP version 2.1: a data envelopment analysis (computer) program. Centre for Efficiency and Productivity Analysis, *University of New England*, Australia.

DUTTA S., LANVIN, B. & WUNSCH-VINCENT, S. (2017). *The Global Innovation Index 2017 Innovation Feeding the World*; Cornell University, INSEAD and the World Intellectual Property Organization.

WANG, E. C. & HUANG, W. (2007). Relative efficiency of R&D Activities: A cross-country study accounting for environmental factors in the DEA approach. *Research Policy*, Vol. 36, No. 2, pp. 260–273.

GRAVES, S. B. & LANGOWITZ, N. S. (1996). R&D Productivity: A Global Multi-industry Comparison. *Technology Forecasting and Social Change*, Vol. 53, No. 2, pp. 125-137. DOI: https://doi.org/10.1016/S0040-1625(96)00068-6

LEE, H.Y. & PARK, Y.T. (2005). An international comparison of R&D efficiency: DEA approach. *Asian Journal of Technology Innovation*, Vol. 13; No. 2, pp. 207-222. DOI: https://doi.org/10.1080/19761597.2005.9668614

ROMER, P.M. (1990). Endogenous technological change. *Journal of Political Eco-*

nomy, Vol. 98, No. 5, pp. 71–102., DOI: https://doi.org/10.1086/261725
ROUSSEAU, S. & ROUSSEAU, R. (1997). Data envelopment analysis as a tool for constructing scientometric indicators. *Scientometrics*, Vol. 40, No.1, pp. 45–56., DOI: 10.1007/BF02459261
ROUSSEAU, S. & ROUSSEAU, R. (1998). The scientific wealth of European nations: Taking effectiveness into account. *Scientometrics,* Vol. 42, No. 1, pp. 75–87., DOI: 10.1007/BFO26927.91
SHARMA, S. & THOMAS, V. (2008). Inter-country R&D efficiency analysis: An application of data envelopment analysis. *Scientometrics*, Vol. 76; No. 3, pp. 483–501., DOI: 10.1007/s11192-007-1896-4
SOLOW, R.M. (1956). A contribution to the theory of economic growth. *The Quarterly Journal of Economics*, Vol. 70, No. 1, pp. 65–94., DOI: 10.2307/1884513
TEITEL, S. (1994). Patents, R&D expenditures, country size, and per-capita income: an international comparison. *Scientometrics*, Vol. 29; No. 1, pp. 137–159., DOI: https://doi.org/10.1016/0040-1625(94)90024-8
THOMAS, V.J., JAIN, S.K. & SHARMA, S. (2009). Analyzing R&D efficiency in Asia and the OECD: An application of the Malmquist productivity index. In: *Science and Innovation Policy*, 2009 Atlanta Conference (pp. 1–10). IEEE.
TODARO, M.P. & SMITH, S.C., (2014). *Economic development.* Pearson, New York, USA Werner, B.M.
WERNER, B.M. & SOUDER, W.E. (1997). Measuring R&D performance – state of the art. *Research-Technology Management*, Vol. 40; No. 2, pp. 34–42. DOI: https://doi.org/10.1080/08956308.1997.11671115

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NEW RULES FOR TRANSPARENCY OF STATE AID IN SLOVAKIA

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ABSTRACT

The aim of the paper is to assess the impact of EU regulations on the creation and development of state aid policy in the Slovak Republic in connection with proper functioning of the EU internal market and the strengthening of transparency. The present Slovak national system of state aid provision and control is significantly influenced by the regulations of modernization of state aid and by the implementation of principles of independence, transparency and publicity. The paper will examine the introduced measures of publicity related to state aid provision from public sources. In the paper we highlight the significance of transparency in the area of public finance provision to economic entities, which reduces uncertainty and enables enterprises to check whether the state aid provided to competitors was legal and legitimate.

Keywords: *public administration, public finance, transparency, publicity, state aid*
JEL Classification: F 02 F15

1 INTRODUCTION

Effective and transparent utilization of public finances of the state is part of the public policy of the state. Public policy in Slovakia is affected by goals, values and policies of the European Union. In Slovakia, public finances are provided in the form of state aid or regional investment aid to economic entities. In the provision of the state aid, emphasis is given on effectiveness and transparency, aiming to prevent that the state aid provision should result in a preferential position of the recipient in relation to competitors on the market. The introduction of transparent procedures in the area of state aid provision can be regarded as a helpful tool towards public and other economic entities. The Antimonopoly Office of the Slovak Republic provides public, comprehensible and substantial on-time information on conditions, strategy and procedures in state aid provision. The unambiguous demonstration of transparency in the state aid area is the publication of reports on the provision of state aid for a given period which are officially available on the website of the Antimonopoly Office of the Slovak Republic.

Another attribute of transparency is the establishment of the Central Register of State Aid, which is an information system of public administration, including the state aid provisions in the Slovak Republic. Currently, the publicity of financial source provisions from the state budget to economic entities strengthens the transparency, thus lowering uncertainty and enabling economic entities to verify if the state aid provided to competitors was legal and legitimate.

In the paper we analyse the introduction of new rules of state aid provision in Slovakia with the emphasis to explicate the substance and the significance of transparency in the area of provision of public finances of the state to economic entities.

1. 1 METHODOLOGY

The subject matter of the paper is the introduction of transparency in the state aid policy in Slovakia. Based on the description and the analysis of the theoretical framework, valid legal regulations, relevant literature, decisions of the Court of Justice (Luxembourg) and documents of the European Union, we examined the causes and the significance of transparency in the state aid area in a broader context.

As for the methodology tools utilised in the study, the focus was put on secondary (applied) research. The research paper also incorporates the synthesis of primary (basic) research. We focused on the analysis of the EU legal documents, including the EU state aid directives and their transposition into the Slovak legal order. Part of the methodology was also the analysis of the state aid and the impacts of provided state aid on public finances.

1. 2 LEGAL BASIS OF THE STATE AID

State aid is considered a new economic instrument that started to be developed and applied in Slovakia in 1995 as part of a competition policy in relation to the fulfilment of criteria connected with the preparation of the Slovak Republic for the membership in the European Union. The purpose of the protection of competition is not to take decisions with regard to the interests of competitors, consumers or the public interest, as the subject of protection primarily is neither the competitor nor the consumer but the competition itself as a key economic phenomenon. The competition law regulates unfair actions in situations where no adequate market pressure from competitors exists (Gubíniová, 2013, p. 54).

The legal basis of the state aid represents a new element which originates in the primary legislation of the European Union; the Slovak law stipulates the conditions of state aid provision. *"The state aid is any advantage granted by public authorities through state resources on a selective basis to any organisation that could potentially distort competition and trade in the European Union*" (Gov. UK, 2016). At present, the notion of "state funding" is also utilised (OJ EU L 352, 24.12.2013, art.1), and indicates the public finance – the state budget, or tax-payers' contributions, respectively.

The present system of state aid provision in Slovakia is based on:

a) Primacy of the EU law over national law (Costa v ENEL Case 6/64),
b) Respecting the EU case-law, the primary reference for interpreting the Treaty of Functioning on the European Union is always the case-law of the Union Courts (OJ EU C 262, 19.7.2016, Para 3),
c) Adherence to Slovak legal act on state aid and to primary and secondary EU legislation.

The current national system of provision and control of state aid is significantly

affected by the rules of modernisation of state aid and introduction of principles of independence, transparency and publicity. The primary legal form of the European Union, the Treaty on the Functioning of the European Union (TFEU), in provision of Article 107 (1) stipulates the general rule regulating state aid as follows: *"Save as otherwise provided in the Treaties, any aid granted by a Member State or through State resources in any form whatsoever which distorts or threatens to distort competition by favouring certain undertakings or the production of certain goods shall, in so far as it affects trade between Member States, be incompatible with the internal market"* (OJ EU C 83.30.3.2010).

According to the case-law of the Court of Justice (Luxembourg), it is up to the Member State to cite possible grounds of compatibility and to demonstrate that the conditions for such compatibility are met (Case C-364/90, Italy v Commission, ECLI:EU:C:1993:157, paragraph 20).

Article 107 (1) of TFEU *"lays down the principle that State aid is prohibited. Article 107(1) of TFEU has the ultimate goal of ensuring the compatibility of national policies with the EU's objective of achieving an internal market. It has therefore been pointed out that the 'Treaty requires that the application of State aid rules must never produce a result which is contrary to the Treaty rules governing free movement"* (Biondi & Farley, 2011, 282).

In order to conclude whether the state aid is present, it must therefore be assessed whether the cumulative criteria listed in Article 107 (1) of TFEU are met (i.e. the transfer of state resources, imputability to the State, the selective advantage, a potential distortion of competition and effect on intra-EU trade) (Commission Decision (EU) 2015/1826). In certain cases, however, such aid may be compatible with the internal market on the basis of Articles 107(2) and 107(3) of TFEU.

In particular Articles 107(3)(a) and (c) of TFEU stipulate that the state is the *"aid to promote the economic development of areas where the standard of living is abnormally low or where there is serious underemployment, and of the regions referred to in Article 349, in view of their structural, economic and social situation"* (OJ EU C 83.30.3.2010). This kind of state aid is known as regional aid. Regional aid promotes the economic, social and territorial cohesion of Member States and the Union as a whole. The main goals of regional aid are the support of economic development of the most disadvantaged areas, the decrease of existing regional

disparities and job creation. Regional differences create social and political problems which must be managed by governmental and regional bodies. The purpose of regional state aid is to create conditions for a more balanced allocation of economic activities in the given space. According to Hošoff (2008), the *"state aid should not principally be granted to such enterprise which does not have chance to compete in competition environment"*.

The goal of the policy of the European Union in the area of state aid is the generation of single conditions and rules for all Member States and for all stakeholders on the internal market. Under the influence of the European Communities, the Slovak Republic adopted law 231/1991, on State Aid, which stipulated provisions for legal regulations of state aid provision to economic entities. The legal regulation was adopted in the Slovak Republic in accordance with EC/EU secondary legislation. The above Slovak law was part of negotiations on the accession of the Slovak Republic to the European Communities.

The primary legal regulation of the EU is amended by a broad spectrum of secondary acts, especially regulations and directives concerning state aid.

Based on the above mentioned law, the State Aid Office in Bratislava was established as an independent authority in the state administration, with the mission to assess, evaluate and authorise state aid, to control state aid provision and to register state aid. The State Aid Office did not provide state aid and did not intervene in decisions on which entities should be granted state aid.

The State Aid Office was dismissed in 2004 and state aid policy was transferred under the Ministry of Finance of the Slovak Republic. The legal regulation on state aid was applied seamlessly until 2015 when the preparation of new legal regulations started, in connection with the reform of state aid rules (2014). Principally, from 2004 until 2016, the state aid policy was in the competence of the Ministry of Finance of the Slovak Republic.

In the period of negotiations of the Slovak Republic on the accession to the EU, the state aid was included in the negotiation chapter named Competition Policy. The European Commission did not object to the fact that state aid policy was managed by a state administration body. Following the adoption of modernisation of state aid regulations and the Europe 2020 Strategy, the Slovak Republic started to implement a substantial institutional change in the state aid policy, with the

aim to support common goals of the European Union and to strengthen competition. The Europe 2020 growth strategy recognises the role of state aid for growth and its capacity "to actively and positively contribute to the Europe 2020 objectives by prompting and supporting initiatives for more innovative, efficient and greener technologies, while facilitating access to public support for investment, risk capital and funding for research and development" (COM (2010) 2020 final 3.3.2010, p. 20).

The modernisation of the EU regulations on state aid has strengthened the accountability of Member States in the assessment of conformity of state aid regulations with new regulations which concern group exemptions. The key element of the State Aid Modernisation Programme was the transparency of state aid provision. "*Transparency of State aid is, therefore, essential for the correct application of Treaty on the functioning of the European Union rules and leads to better compliance, greater accountability, peer review and ultimately more effective public spending*" (OJ L 187, 26.6.2014, pp. 1–78).

"*Transparency means giving market participants relevant information about those public interventions that might have potentially distortive effects on competition and on intra-EU trade, i.e. government aid that confers selective advantages to companies*" (European Commission, 2016).

The request regarding transparency concerns all state aid in general, with the exception of minor aid, not exceeding 500,000 Euro, in agricultural industry not exceeding 60.000 Euro.

Catalán and Clayton discuss the reforms of EU state aid announced in 2012 and the institutional framework of state aid control within the EU (Catalán & Clayton, 2013, pp. 21–34). The basic goals of the state aid system modernisation include the promotion of sustainable and intelligent growth on a competitive internal market, focus on ex ante cases with the most extensive impact on the internal market, closer cooperation of Member States in enforcing state aid rules and optimisation of legislation and the acceleration of the decision-making processes (Vítek, 2014).

On the level of European Union, the Commission Regulation (EU) No 651/2014 of 17 June 2014 was adopted, declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty (entry

into force on 1 July 2016), regulated transparency in Article 9 (OJ EU L 187, 26.6.2014). Due to the *"secondary legal act, all member states shall be obliged to secure the publication on a comprehensive state aid website, at national or regional level (summary information)"*. The European Commission determined clear rules for the publication of information on granted state aid. The creation of common rules for the publication of information on state aid increases the transparency and prevents discrimination.

2 IMPLEMENTING NEW EU RULES FOR STATE AID IN SLOVAKIA

General rules on state aid are regulated in the Treaty on Functioning of the European Union and in EU secondary acts. The European Commission adopted the rules on the modernisation of state aid. In the Communication on State Aid Modernisation of 8 May 2012, the Commission announced three objectives pursued in the modernisation of State aid control:

(a) To foster sustainable, smart and inclusive growth in a competitive internal market;

(b) To focus Commission ex ante scrutiny on cases with the biggest impact on the internal market while strengthening the cooperation with Member States in State aid enforcement;

(c) To streamline the rules and provide for faster decisions (COM/2012/0209 final).

These rules had broadly affected the factual dimension of new Slovak legal regulations on state aid with the aim to harmonise Slovak legal adaptation with the recommendation of the European Commission and the achievement of the Strategy Europa 2020 objectives. All Member States implemented modernised regulations on state aid into their legal orders with the purpose to create conditions for reasonable functioning of the internal market and the protection of competition rules.

The new act on state aid respects the rules of modernisation of state aid and delimitates solely the basic rules for state aid and state aid *de minimis*, with respect to Article 109 of TFEU, which stipulates that the legislation on state aid and state aid *de minimis* is adopted by the European Union.

The Slovak law indicates the Antimonopoly Office of the Slovak Republic as the coordinator of state aid. This means that the state aid policy is not in the competence of the Ministry of Finance of the Slovak Republic, which used to be the coordinator of state aid, but was not an independent body. The Ministry of Finance had always implemented the policy of political parties. This intervention into institutional competences of state administration bodies was determined by the Position of the Commission Services on the development of the Partnership Agreement and programmes in Slovakia for the period 2014–2020.

The European Commission has unambiguously pointed out that Slovakia should secure the independence of the state aid coordinator from bodies providing the aid (Ministry of Finance of the Slovak Republic).

In this respect, we have to remind that in the period of the negotiations on Slovakia's membership in the EU, the European Commission did not object to the fact that the state aid coordinator was the Ministry of Finance of the Slovak Republic.

In connection with the introduction of new institutes in state aid area (the test of equilibrium, the stimulation effect and the case-law development) and the development of secondary legal acts, certain rules were changed and an institutional change in state aid area was introduced in Slovakia. The Antimonopoly Office of the Slovak Republic is a state authority for the protection of competition, whereas state aid area in the EU is the subject matter of the same Directorate General as the protection of competition. Based on these facts, we consider it appropriate that state aid policy is in the competence of the Antimonopoly Office of the Slovak Republic as state aid policy also considers the rules of competition protection and proper functioning of the internal market. The state aid is an economic instrument that can influence trade among Member States and may negatively affect competition. The system of state aid provision is based on several facts of which competition is of the greatest significance. The president of the Antimonopoly Office of the Slovak Republic, under the Statute of the Antimonopoly Office, is not a member of the Slovak government. This suggests that the state aid coordinator is not part of the political cycle and changes and in this way, the relative independence of the state aid coordinator is ensured. The institutional independence of the Antimonopoly Office of the Slovak Republic is demonstra-

ted by the fact, that the Office neither accepts directions from the Slovak government, nor is the body obliged to subordinate to political interests of governing political parties. The Antimonopoly Office of the Slovak Republic, in accordance with Section 16, Article 5 of Act 358/2015 Coll., on Adjustment of Certain Relations in State Aid and *De Minimis* Aid and on Amendments and Supplements to Certain Acts, is obliged to elaborate reports on state aid provisions in the Slovak Republic. The reports provide factual and summary information on volumes of granted state aid. They include the evaluation of the contribution of state aid as well as the draft of measures for following procedures in state aid area in competence of relevant providers.

With respect to transparency, based on the given act, the central register for the registration of state aid and state aid *de minimis* was established with the Antimonopoly Office of the Slovak Republic as the state aid coordinator. The Central Register, under the cited Act on State Aid, is the information system of the public administration, including the data on provided state aid in the Slovak Republic. The Central Register includes information referring to the volume of state aid, forms, the purpose of state aid, etc. The information is published within six months from the date the state aid was granted and it is stored for at least ten years and is available to the general public without any limitations. The data on the provided state aid are kept by the state aid provider. It means that any subject in Slovakia can access the data on state aid provision. Thus, the principle of transparency is satisfied by the publication of information on state aid to the general public in a comprehensive way, with substantial information on state aid recipients and on the decisions of the relevant authorities.

In the Czech Republic, the Central Register of aid of minor scope (*de minimis*) was established on 1 January 2010. The mission of the register is to operate as the central system of evidence of aid of minor scope (*de minimis*) which is provided under EU regulations, directly applicable in Member States.

Transparency and equal treatment allow the public to better understand the state aid policy; in this way the state aid system becomes more trustworthy and effective. With respect to the institute of transparency, the allegations to the effect that the state aid is the tool of political protectionism are removed. The real effort to implement transparency requires self-discipline of the decision-making

authorities, which should be the guarantors of stability, legality and legitimism of political decisions and justifications thereof. The possibility of public control of the state aid policy promotes the motivation of decision-making authorities to fulfil their missions as best they can, in conformity with valid legal regulations. Thanks to the establishment and operation of the Central Register, the public has obtained access to all relevant legal acts and information on state aid. At the same time, the institute of transparency creates suitable conditions for equal treatment.

In the framework of the institute of transparency, the applicants for state aid are provided with information

- On conditions of state aid provision,
- On approval policy regarding state aid provision,
- On principal legal regulations, norms and documents designating competence and accountability of authorities and individuals,
- On granted state aid.

3 IMPACTS OF STATE AID ON PUBLIC FINANCES

As stated above, the provided state aid impacts public finances. Table 1 provides an overview of the volume of state aid and the impacts of state aid provided to enterprises that pursue entrepreneurial activities in Slovakia.

Facts on state aid provision in the Slovak Republic

Under the Act on State Aid, formerly the Ministry of Finance of the Slovak Republic and currently the Antimonopoly Office of the Slovak Republic is obliged to elaborate annual draft reports on the state aid granted in the Slovak Republic. The document is approved by the Slovak government and put forth to the European Commission.

Based on the reports, we analysed the following data.

Tab. 1 » The shares of state aid provided in the Slovak Republic from 2014 to 2017

Year	2014	2015	2016	2017
(in %)	0.43 %	0.56 % of GDP	0.48 % of GDP	0.53 % of GDP
Per inhabitant (in EUR)	59.42 EUR	81.21 EUR	71.38 EUR	55.41 EUR
Per employee (in EUR)	134.74 EUR	179.68 EUR	154.41%	118.73 EUR
Of state budget expenditures (in %)	2.07 %	2.40 %	2.54 %	1.73 %
Overall volume of state aid granted	322.14 mil EUR	440.65 mil EUR	387.98 mil EUR	301.57 mil EUR

Source: Report on State aid 2014, 2015, 2016, 2017. Available at: www.statnapomoc.sk [cited 10 Nov. 2018]
http://www.statnapomoc.sk/wp-content/uploads/2018/06/Sprava.pdf
http://www.statnapomoc.sk/wp-content/uploads/2017/07/Sprava.pdf
http://www.statnapomoc.sk/wp-content/uploads/2015/06/Sprava.pdf

The above table shows that the largest share of state aid was provided in 2015, which had a positive impact on the number of created jobs and regional GDP growth.

Based on the statistical figures, it is possible to state that the state aid is connected to the national budget expenditures. Therefore, the provision of state aid is a matter of public interest. The regulations referring to the transparency principle make it possible to make public the information on the utilisation of public finances. The public awareness of the public financial sources is part of the principles which are the foundation base of the rule of law in democratic states.

The table includes volumes of state aid provided to entrepreneurs. The biggest amount of resources from the public budget was provided to entrepreneurial entities in 2015. The provision of state aid is a matter of public interest.

The Slovak Republic as an EU Member State is obliged to comply with the EU legislation, resulting from the EU treaties. The proper application of the EU legislation is monitored by the European Commission.

Based on the loyal cooperation, as anchored in Article 4, Para 3 of the Treaty on the European Union, Member States are obliged to adopt all necessary measures

of general and special character in order to assure the implementation of obligations resulting from treaties and other legal act of EU institution. According to this principle, Member States may not adopt any measures which could jeopardize the achievement of EU goals. The European Commission as an executive body is charged with the overall responsibility to ensure the effective control of state aid. The Directorate General for Competition is charged with the main accountability for the management of competition policy and state aid policy in the European Union.

4 CONCLUSIONS

The state aid policy, which belongs among public policies, is developing continuously; its development, however, is determined by the adoption of clear-cut regulations which facilitate transparency in the process of state aid provision and publicity. Based on factual information, we showed that the modernisation of regulation of state aid has contributed to the application of transparency in publicity and in publication of information on state aid provision to citizens.

The legal framework determined directly in the Treaty on Functioning of the European Union (Art. 107) consists of a stable set of generally valid regulations based on objective criteria applied in all EU Member States. This is the basis of accurate functioning of the EU internal market.

In Slovakia, the institutional change and the state aid policy is in competence of an independent authority – the Antimonopoly Office of the Slovak Republic. This could be considered as a step forward towards strengthening of independence and non-political treatment.

The Antimonopoly Office of the Slovak Republic puts emphasis on effective application of the EU state aid regulations. The providers of state aid are obliged to ensure compliance with the stimulation effect as well as compliance with the principle of maximum intensity of state aid. Following the establishment of the Central Register of State Aid, the databases on state aid providers and state aid recipients are publicly accessible, which can be viewed as a positive element in a transparent provision of state aid.

The Register includes basic information concerning the state aid (e.g., state aid schemes, group exemption clauses, individual state aid), aid *de minimis* (e.g., aid *de minimis* schemes, individual minimal aid), state aid providers and state aid

administrators (e.g., the list of state aid providers, including the official names and identification numbers of legal entities), the state aid recipients (the name of the recipient, the volume of state aid approved, the volume of refund).

The transparent and simple system decreases the probability of non-transparent utilisation of provided financial sources. The Antimonopoly Office of the Slovak Republic is entitled to supervise whether the state aid provision is effective, efficient and transparent.

The application of transparency and accountability principles in the provision of financial sources provided from the state budget to justified (eligible) economic legal entities lowers the risk of misuse and unauthorised treatment thereof.

REFERENCES

Antimonopoly Office of the Slovak Republic (2018). *Report on State Aid* 2014, 2015, 2016, 2017. [Online]. Available at: http://www.statnapomoc.sk

BIONDI, A., & FARLEY, M (2011). The relationship between State aid and the single market. In: SZYSZCZAK, E. (Ed.), *European Handbook on State Aid Law.* Cheltenham: Elgar, 2011.

CATALÁN, M. J. S. & CLAYTON, M. (2013). *State aid modernisation: another reform?* ERA Forum Vol. 14, Issue 1, pp. 21–34, June 2013.

Commission Communication (2010). *"Europe 2020 – a strategy for smart, sustainable and inclusive growth*". COM (2010) 2020 final, 3 Mar 2010, p. 20.

Commission Regulation (EU) No 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty Text with EEA relevance. OJ L 187, 26 Jun 2014, pp. 1–78.

Commission Regulation (EU) No 1407/2013 of 18 December 2013 on the application of Articles 107 and 108 of the Treaty on the Functioning of the European Union to *de minimis* aid L 352, 24 Dec 2013.

Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of Regions EU *State Aid Modernisation* (SAM), COM/2012/0209 final.

European Commission (2017). *State aid: Commission opens investigation into proposed public financing of Jaguar Land Rover plant in Slovakia.* Press release. Available at: http://europa.eu/rapid/press-release_IP-17-1450_en.htm

European Commission (2017). *Guidelines on regional State aid for 2014–2020.* OJ EU C 209, 23 Jul 2017.
European Union (2010). *The Treaty on the Functioning of the European Union.* OJ EU C 83, 30 Mar 2010.
European Commission (2016). *State aid.* ISBN 978-92-79-54736-2, ISSN: 2315-3113.
European Court EC (1993). *Case C-364/90, Italy v Commission*. ECLI:EU-:C:1993:157, paragraph 20.
European Court EC (1964). *C -6/64 Flaminio Costa* v E.N.E.L. ECLI:EU:C:1964:66.
Gov. UK (2016). *Policy Paper: State aid modernisation*. [Online]. Available at: https://www.gov.uk/government/publications/state-aid-modernisation/state-aid-modernisation
GUBÍNIOVÁ, K. (2013). Spotrebiteľ v centre pozornosti cieľov súťažného práva. In: *Marketing Science and Inspirations*, 2013, volume VIII, issue 2, pp. 54–58. ISSN 1338-7944.
HOŠOFF, B. (2008). *The role of government in the development of competitiveness.* Working Paper. Bratislava: Slovak Academy of Sciences. ISSN 1337–5598.
National Council of the Slovak Republic (2017). *Act No. 358/2015*, on State Aid.
NOVÁČKOVÁ, D. (2016). Fundamental changes in the State aid policy in the Slovak Republic. In: *Hradec Economic Days* 2016. Published by University of Hradec Králové. ISSN 2464-6059. pp.716–727.
VÍTEK, L. (2013). Changes in state aid within the Eu and regional state aid from 2014. In: *Current Topics of Economic Theory and Practice in International Business 2013*. Bratislava: Paneurópska vysoká škola. ISBN 978 80-89453-04-07.

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