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## Article

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# Interest and tax burden on corporations in the Czech industrial and banking sector after 2008

Jaroslav Sedláček<sup>1</sup>, Daniel Němec<sup>2</sup>

**Abstract:** The present paper deals with the interest and tax burden of corporations in the Czech industrial and banking sector as well as with the identification of the differences between the two sectors, including the evaluation of their developmental trends in the period after the economic and financial crisis of 2008. The interest and tax burden on business entities is determined by negative cash flows that reduce the value of their assets and equity. The basis of the research is the analysis of both components of the financial burden on corporations in these sectors over the past eight years and the identification of factors influencing their capital structure and performance. According to DuPont's equation, the burden is expressed by interest and the tax reduction of corporation's earnings before interest and taxes. The amount of the financial burden depends on the macroeconomic environment where the corporations operate. Our analysis identified an asynchronous dependence between the real payments and changes in the interest and tax rates. The reduction of both rates has had a positive effect on the performance of Czech corporations and increased their capital resources. They became more attractive to foreign investors, and the return on invested capital improved. Based on the results of the analysis, we evaluated the differences in the performance of the average corporation in the banking and industrial sectors.

**Key words:** financial burden of corporations, tax burden, interest burden, accounting statements, financial analysis, performance and efficiency

**JEL Classification:** M21, M41, G32

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## Introduction

The financial burden on corporations<sup>3</sup> is closely related to the financial flows that are being made by the corporation to ensure its entire business. The financial flow has the

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<sup>3</sup> The term of corporation includes business entities of all legal forms operating in the monitored branch of the Czech economy.

opposite direction than the flow of assets. Purchase and production are associated with the expenditure of funds while sales are associated with financial income. Other financial flows are related to profit sharing, investment, financial instruments, research and development etc. Financial flows include not only cash flows but also flows of a corporation's capital. According to accounting rules, money and their equivalents have the form of a corporation's assets, while capital is the source of corporate financing (liability or debt).<sup>4</sup> It is not just the financial resources needed to buy the assets, but also to bridge the time lag between the expenditures spent on completing the final product (purchasing services, energy payments, wage payments and other operating or financial expenses) and receiving money for its sale. Positive cash flows (inflows) should thus prevail over negative ones (outflows).

Depending on the place of origin, financial flows are divided into internal and external. The first source of financing is labelled as the internal flow of revenue, originating from the sales of products, services or goods. (Wagenhofer 2003). Additional capital created by its own activity flows into the corporation to be used again.<sup>5</sup> The second source is the external financial flows, which consist, on the one hand, of investors' deposits stemming from the purchase of shares or interests (equity) and, secondly, from loans and credit, or debt securities issued (foreign capital). The price for which a corporation receives capital is the financial burden (including government levies) that measures so-called capital costs. The corporation seeks such a relationship between the amount of equity and foreign capital (capital structure) during which the lowest cost of capital is attained. Bokpin (2009), Nurmet (2011), and Klepáč and Hampel (2016) point out that in optimising the capital structure, it is necessary to consider, apart from the cost of the capital and tax shield, the costs of the financial distress of the corporation as well. Financial flows flowing to both foreign capital and own equity holders take away some of the corporations created equity thereby reducing the economic efficiency of their activities and value (Brealey et al. 2006; Altman, 1968). An open question remains whether state and creditor requirements can be met without more serious consequences for the further development of corporations, or whether changes in interest and tax rates can significantly affect real income tax and interest payments. The answers to this question are the motivation for our research, which should confirm the different impacts of the financial burden on individual sectors of the economy, namely the industrial sector (is) and the banking sector (bs). In this paper, we will focus on the period after 2008, which includes both the economic and financial crisis at the end of 2008 and the period of revival of the Czech and world economies.

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<sup>4</sup> Czech accounting legislation identifies the name of the liability and the capital, while in corporations' finances we are more likely to encounter the designation of capital in the meaning of long-term capital, from which the fixed assets of the corporation and the fixed part of the current assets are financed.

<sup>5</sup> This is self-financing created from sales, retained payments and profits.

## 2. Literature Review and Methodology

The main objective of the present paper is to evaluate the interest and tax burden on corporations in the Czech industrial and banking sectors. To fulfil this objective, we identify the differences between the two sectors, including the assessment of their development trends since 2008.

Moreover, we examine the factors influencing their capital structure and performance and assess the effects of the proposed changes in the interest and tax burden on commercial corporations. In this paper, we will focus on the question of whether there is a relationship between the statutory tax rate and the effective tax rate in the examined sectors. Furthermore, we investigate the relationship between the interest rate and the interest burden in the two sectors under review, namely in the period after the financial crisis and the economic downturn from the year 2008.

The basic criterion for measuring the production power of a corporation is the Earnings Before Interest and Taxes (EBIT) ratio indicator calculated from the profit and loss statement as the surplus of sales performance over power consumption after deducting the consumed labor, depreciation and other operating expenses and financial performance (Damodaran 2000; Ohlson, 1980). After drawing the contribution designated for creditors (capital costs) Earnings Before Taxes (EBT) remains for the corporation. The last contribution, according to Rajan and Zingales (1995), is corporate income tax, determined by the state, and after it is paid, Earnings After Taxes (EAT) remains available to the owners.

The EAT achieved by a corporation for a business year is placed in the balance sheet of equity and increases the accounting and often also the market value of the corporation. It is intended for distribution after approval by the general meeting. To measure the effect of the financial burden on corporate profitability, we can use the decomposition of the second Du Pont equation (Sedláček 2007) in the form of:

$$ROE = \frac{EAT}{E} = \frac{EBIT}{S} \times \frac{EBT}{EBIT} \times \frac{EAT}{EBT} \times \frac{S}{A} \times \frac{A}{E} \quad (1)$$

Where:

- ROE - Return on Equity is a measure of the rate of return to stockholders
- EBIT - Earnings Before Interest and Taxes defined as the sum of operating and financial results of operations
- EBT - Earnings Before Taxes represents EBIT reduced by the interest expense recognised by the corporation
- EAT - Earnings After Taxes represents the net (disposable) profit of the corporation
- S - Net Sales from the sale of products, goods and services
- A - Total Assets
- E - Total Equity
- EBIT/S - Return on Sales (ROS)
- EBT/EBIT - Is referred to as the corporation's interest burden (IB). It expresses the influence of the price of foreign capital on the profitability of the corporation. The cost of foreign capital is determined by the macroeconomic environment and describes the conditions under which the corporation

- receives foreign sources of financing indirectly. If a corporation uses foreign capital, then the  $EBT / EBIT$  inequality  $< 1$
- EAT/EBT - EAT / EBT - expresses the corporation's tax burden (TB), i.e. the impact of the state's tax policy on the profitability of a corporation. It is a factor that is objectively determined by the environment in which the corporation is located. If a corporation has a positive economic result, then the EAT / EBT inequality is  $< 1$
- S/A - Asset Turnover characterises the level of utilisation of the assets of a corporation
- A/E - Equity multiplier expresses the level of corporate indebtedness and refers to the financial leverage (FL).

To analyse the financial burden (financial stability) on the corporation, we use the data published by the Ministry of Industry and Trade (MIT) of the Czech Republic (MIT 2016) and by the Czech National Bank (CNB 2016). They represent aggregated figures from industry and bank corporate statements, whose data are summarised in Table 1. State values are calculated as averages from the values reported by corporations at the beginning and end of each year. Corporate tax rates (T%) and interest rates on loans granted to non-financial corporations (I%), reported in the last two lines of the table, were also taken from the CNB website (2016). In addition, the income tax rates for 2006 and 2007 (24%) and the interest rate from 2007 (5.10%) were used in the calculations.

**Table 1. Input data for the analysis of the financial burden of Czech corporations**

Item (in bill. CZK)	2008	2009	2010	2011	2012	2013	2014	2015
Assets <sub>(is)</sub>	4480	4910	4972	5712	5785	6384	6446	6384
Equity <sub>(is)</sub>	2324	2519	2516	2711	2912	3059	3081	3147
Sales <sub>(is)</sub>	3759	3351	3656	4115	4225	4222	4404	4582
EAT <sub>(is)</sub>	233	234	260	246	328	302	301	338
EBT <sub>(is)</sub>	322	312	332	318	416	389	385	431
IT <sub>(is)</sub>	365	336	351	338	433	407	402	444
Interest paid - I <sub>(is)</sub>	43	24	19	20	17	18	17	13
Income tax - T <sub>(is)</sub>	89	78	72	72	88	87	84	93
Assets <sub>(bs)</sub>	4044	4094	4188	4475	4633	5142	5309	5468
Equity <sub>(bs)</sub>	292	320	342	362	427	463	512	527
Sales <sub>(bs)</sub>	243	247	235	240	244	232	230	223
EAT <sub>(bs)</sub>	46	60	56	53	64	61	63	66
EBT <sub>(bs)</sub>	54	71	66	63	77	73	76	81
EBIT <sub>(bs)</sub>	148	141	128	125	139	121	124	121
Interest paid - I <sub>(bs)</sub>	94	71	62	62	62	49	48	40
Income tax - T <sub>(bs)</sub>	8	11	10	10	13	12	13	15
Interest rate (I%)	4.80	3.72	3.47	2.86	2.61	2.26	2.22	1.74
Tax rate (T%)	21	20	19	19	19	19	19	19

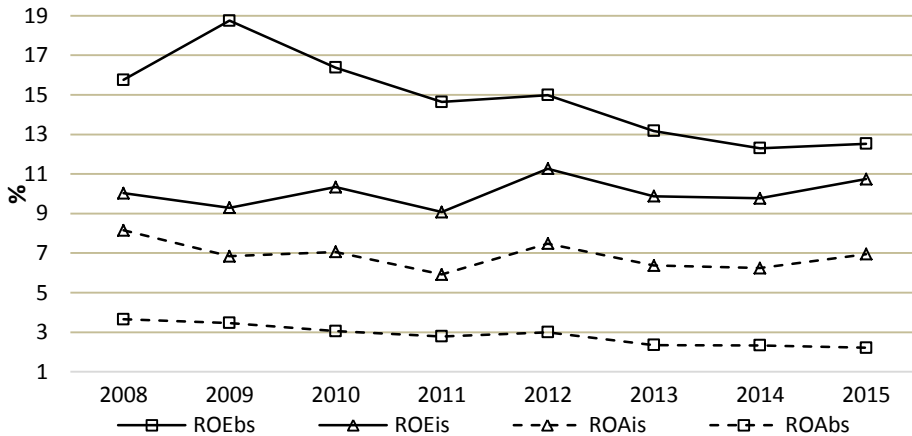
Source: own calculation based on the data of the MIT (2016) and CNB (2016)

A comparison of the development of the banking sector (bs) and industrial sector (is) financial indicators in the period from 2008 to 2015 shows Figure 1. Our paper focuses on the analysis of the relationship between the development of the statutory tax rate and the average effective tax rate (expressed as the proportion of the tax on profits paid

before tax) and the relationship between the development of the average interest rate and the interest rate on EBIT. Before proceeding with the statistical and econometric analysis, tests of stationarity of the corresponding key variables were carried out, using the unit root test. Table 2 presents the test results.

**Figure 1. Development of financial ratios of the banking and industrial sector**

Source: own calculation based on the data



of the MIT (2016) and CNB (2016)

**Table 2. Unit root tests of key variables**

Variable	Description	ADF test (constant)	ADF test (constant and trend)	KPSS test
T%	The tax rate	0.000	0.000	0.053
T/EBT <sub>(bs)</sub>	Effective taxation	0.941	0.000	0.042
T/EBT <sub>(is)</sub>		0.000	0.000	0.097
I%	Interest rate	0.019	0.537	0.034
I/EBIT <sub>(bs)</sub>	Interest burden	0.633	0.224	> 0.100
I/EBIT <sub>(is)</sub>		0.017	0.037	0.054

Note: The table shows the p-values of the corresponding tests. The ADF test corresponds to the augmented Dickey-Fuller Test, where the optimal lag order was selected using the modified Akaike Criterion.

In the case of tax rates and effective taxation, both tests prove the stationarity or the trend stationarity at the 1% level of significance. In the case of interest rates and the proportion of interest paid on EBIT, the test results differ only in the case of the banking sector. Concerning the low power of the ADF test, we use the results of the KPSS test that proves the stationarity of the variables. Due to the stationarity of the examined variables, the analysis based on the correlation coefficients may be treated as a correct method. The same conclusion holds when using the linear regression model and the statistical tests of equal means on the original variables (i.e. without the necessity to differentiate the respective variables). Regarding linear regressions, we test the stationarity of the residuals to eliminate the possibility of spurious regression.

### *Tax burden*

Tax is defined as a mandatory, statutory, regular, irrecoverable and non-target payment to the public budget. The tax is drawn from pre-defined entities for part of their retirement for an irreversible principle<sup>6</sup> (without the right to consideration by the public sector, which would correspond to the amount of tax paid by them). Health and social security contributions and local taxes are also considered to be the taxes according to the OECD classification. The corporation is burdened by all these taxes if the circumstances that require their payment arise.

Indirect taxes (value added tax and excise tax) are neutral to a corporation that is a registered payer. In this case, the corporation is only a tax collector (payer), the taxpayer is the final consumer who buys the product, goods or service. Non-payers pay the tax in the price of purchased inputs (material, energy, machinery, etc.), but they do not tax the outputs and are not entitled to a tax deduction. Tax becomes part of the asset valuation with them.

Direct taxes are paid by corporations (as a taxpayer) from their assets (it is drawn from a portion of their revenues). These include property taxes (real estate tax, real estate transfer and road tax) and corporation tax. Property taxes are a cost for a corporation (Samuelson and Nordhaus, 1992; Sedláček, 2016), which is also considered to be a tax cost (expense) under the Income Tax Act.<sup>7</sup> The subject of the income tax is the accounting gain (loss) ascertained from the difference of the income and expense before tax, which is subsequently adjusted by:

- amounts that cannot be included in costs under the Income Tax Act (for example, deficiency amounts exceeding reimbursements for them, costs of representation of the corporation, differences between tax and accounting depreciation),
- amounts that are included in the costs in the wrong amount,
- all amounts unduly reducing revenue,
- tax-exempt revenue (e.g. revenue from small-scale power plants), revenue not included in the tax base (e.g. income taxed with withholding tax at the source of the payment).

With these adjustments, accounting profit is transformed into the tax base from which the tax is calculated. Income tax is an accounting tax rather than a tax cost, i.e. it does not enter the profit or loss of a corporation before tax or into the income tax base. Tax deduction, on the contrary, means for the corporation a reduction in its assets (money) and the drawing of the generated profit for the current period (EBT). The amount of cash outflows of the corporation to the state is expressed by the tax reduction of profit (TB), which is determined from the equation:

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<sup>6</sup> This is different from fees, which also form the revenue side of the public budget, but in the form of payments for public sector services.

<sup>7</sup> Contributions paid by corporations to employees on statutory health insurance and social security are also a tax cost.

$$TB = \frac{EAT}{EBT} \quad (2)$$

It is clear from Tables 3A and 3B that the value of the tax burden (TB) does not show a clear tendency while the influence of TB on the development of shareholders' equity in the second DuPont equation (DeAngelo and Masulis 1980) also corresponds to this. The indicator shows the positive impact of the state's macroeconomic policy in the form of a reduction in income tax rates.

**Table 3A. Development of tax reduction and state share in profit of an average Czech bank**

Year	EAT	EBT	TB	T%	T	T/EBT	E	E/A	ROE %
2006	x	x	x	24	x	x	x	x	x
2007	x	x	x	24	x	x	x	x	x
2008	46	54	0.85185	21	8	0.14815	292	0.0722	15.753
2009	60	71	0.84507	20	11	0.15493	320	0.0782	18.750
2010	56	66	0.84848	19	10	0.15152	342	0.0817	16.374
2011	53	63	0.84127	19	10	0.15873	362	0.0809	14.641
2012	64	77	0.83117	19	13	0.16883	427	0.0922	14.988
2013	61	73	0.83562	19	12	0.16438	463	0.0900	13.175
2014	63	76	0.82895	19	13	0.17105	512	0.0964	12.305
2015	66	81	0.81481	19	15	0.18519	527	0.0964	12.524

Source: own calculation based on the data of the CNB (2016)

The T / EBT share also reflects how the corporation divides its profits with the state and corresponds to the value of one minus TB. In absolute terms, the income tax collection in the banking sector increased from CZK 8 billion in 2008 to CZK 15 billion in 2015, while the relative tax burden increased by 3.02 percentage points. In 2015, the average corporation in this industry paid 18.52% tax from its operating profit, reduced by interest at the current tax rate of 19%.

**Table 3B. Development of tax reduction and state share in profit of an average Czech industrial business**

Year	EAT	EBT	TB	T%	T	T/EBT	E	E/A	ROE %
2006	x	x	x	24	x	x	x	x	x
2007	x	x	x	24	x	x	x	x	x
2008	233	322	0.72360	21	89	0.27639	2324	0.51875	10.026
2009	234	312	0.75000	20	78	0.25000	2519	0.51303	9.289
2010	260	332	0.78313	19	72	0.21686	2516	0.50603	10.334
2011	246	318	0.77358	19	72	0.22641	2711	0.47461	9.074
2012	328	416	0.78846	19	88	0.21154	2912	0.50337	11.263
2013	302	389	0.77635	19	87	0.22365	3059	0.47917	9.872
2014	301	385	0.78182	19	84	0.21818	3081	0.47797	9.769
2015	338	431	0.78422	19	93	0.21577	3147	0.49295	10.740

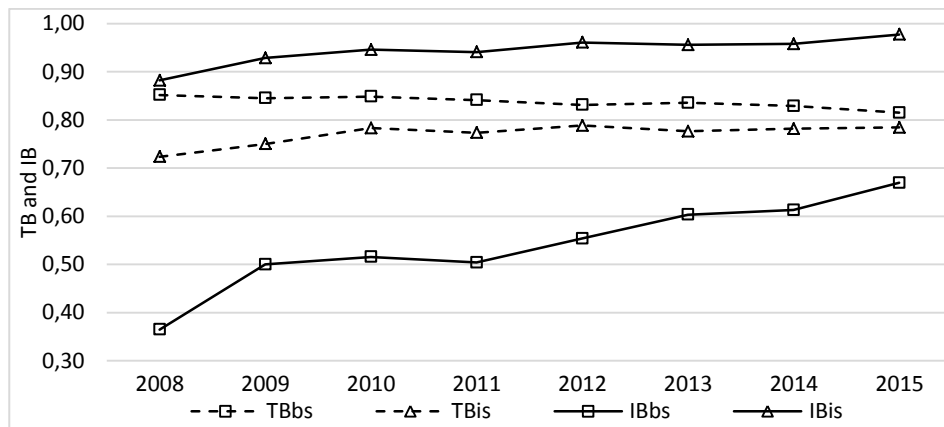
Source: own calculation based on the data of the MIT CR (2016)

The reduction in the tax burden was positively reflected in the growth of equity by corporations as a source of self-financing. The positive trend stopped in 2010 as a result of



the drop in the value of the quota in equity ( $E / A$ ) in the previous year. In ensuing years, the constant tax rate allowed corporations to manage a net operating surplus, which improved the capital of the owners and allowed them to invest in expanding production, thereby enhancing the company position and independence. A comparison of the development of the average corporate tax burden in the banking and industrial sector illustrates Figure 2.

**Figure 2. The impact of tax and interest burden on the profitability of corporations**



Source: own calculation based on the data of the MIT CR and CNB (2016)

The dependence of statutory and effective tax rates is shown in Table 4. Regression coefficients from simple regressions expressing the relationship between the effective taxation of banks and businesses and the statutory tax rate (and their deferred values) are shown here. The results show the statistically significant effect of the statutory tax rate on the effective tax rate.

**Table 4. Estimates of Effective Tax Dependence on Statutory Tax Rates**

	Effective bank taxation <sub>(bs)</sub>			Effective corporate taxation <sub>(is)</sub>			
	<i>L</i> <sub>i</sub>	Coefficient	Coefficient of determination	KPSS residual test	Coefficient	Coefficient of determination	KPSS residual test
Statutory tax rate	0	-0.0096 **	0.349	> 0.100	0.0292 ***	0.956	> 0.100
	1	-0.0046 ***	0.4477	> 0.100	0.0118 ***	0.888	> 0.100
	2	-0.0041 ***	0.5613	> 0.100	0.0090 ***	0.789	> 0.100

Note: \*, \*\* and \*\*\* indicate the statistical significance of the regression coefficient at 10%, 5%, and 1% significance level respectively. Standard errors were calculated using the robust standard errors (Newey-West estimator). The KPSS test results correspond to the p-value of the unit root test of the residuals from each regression. In all cases, residuals can be considered as stationary.

In the case of the banking sector, there is a negative relationship between the investigated variables, with the most significant relationship (measured by the coefficient of determination of 56.1%) being observed in the case of the statutory tax rate lagged by two periods. With respect to the estimated negative sign, this relationship cannot be seen as a causal one, i.e. the decline in the corporate tax leads to an increase in the rate of effective taxation. Rather, the explanation is that in 2008 the effective tax rate was less than 15% (at a statutory tax rate of 21%), and this gap gradually decreased to 19% in 2015. From this perspective, banks could gradually exhaust their tax optimisation potential, which the financial crisis of 2008 partly contributed to.

On the other hand, the relationship between the statutory tax rate and the effective tax rate for industrial corporations is more straightforward. The expected direct relationship between these variables may be found here, where the drop in the statutory tax rate may lead to a reduction in effective taxation immediately (i.e., the most important influence was shown when the variable without lag was used). In this case, the model explains 95.6% of the variability in the effective tax burden.

Looking at the difference between effective tax rates and statutory tax rates, it turns out that we are rejecting a hypothesis in our sample that effective taxation and statutory tax rates would be equal (see Table 5).

**Table 5. Comparing statutory and effective tax rates**

	Average deviation	Standard deviation	Test statistics	p-value of the significance test
Banks <sub>(bs)</sub>	-0.031	0.0070	-4.416	0.003
Corporation <sub>(is)</sub>	0.036	0.0056	6.449	0.000

*Note: Standard parameter deviations were calculated using robust standard errors (Newey-West estimator) with a corresponding regression of the difference between the effective and statutory tax rates to the level constant.*

In the case of the banking sector, there is a statistically significant negative difference (i.e. the effective tax rate is on average statistically significantly lower by about 3% than the statutory tax rate). In the case of industrial corporations, however, this difference is positive (and is on average at 3.6%).

### *Interest burden*

A lack of equity in the form of retained earnings and write-offs forces corporations to finance with foreign capital (D). It may be in the form of short-term debts (short-term bank and commercial loans, employee debt, debt securities, loans, etc.) or long-term liabilities to creditors who have lent the corporation their money for more than one year or invested in long-term bonds issued by the corporation. The relationship between the volume of own and the foreign capital depends on the nature of the business, the macro-economic environment in which the corporation is located, and the risk associated with the acquisition of resources. In general, the cost of equity paid in the form of a dividend or profit share is higher than the price of foreign capital paid in the form of interest (Higgins 1995). The reason for this is the fact that the investor is the main bearer of the risk associated with the bad economy or even the bankruptcy of the corporation, and it can lose its capital.

The optimal capital structure of the corporation arises at the minimum cost of capital (C), which is determined as the sum of the weighted costs of foreign ( $n_D$ ) and own ( $n_E$ ) capital according to the equation:

$$n_C = n_D + n_E = (1 - T\%) \times \frac{D}{C} + (\text{dividend yield} + \text{dividend growth rate}) \frac{E}{C} \rightarrow \text{minimum} \quad (3)$$

The corporation should only involve foreign capital in financing if the financial leverage is positive. Financial leverage increases (strengthens), similarly as in physics, the ability to earn capital using foreign capital. Owners are therefore seeking more financial leverage to multiply their returns (the issue of new shares would mean lowering the ownership and voting rights of existing shareholders). However, the positive effect of the debt ratio on return on equity only occurs when Return on Assets (ROA) is greater than the interest rate (I%). Otherwise, the financial leverage is negative. On the contrary, creditors prefer the lowest possible debt (D / A), as a larger share of equity means a bigger security blanket against their losses in case of the liquidation of the corporation (Bauer 2004; Levy and Sarnat 1999).

The conditions under which a corporation receives foreign capital are expressed in the cost of foreign capital that the corporation pays for providing capital to creditors, the so-called interest burden (IB):

$$IB = \frac{EBT}{EBIT} \quad (4)$$

The growing trend of the IB indicator is strengthening, according to Du Pont's second decomposition, as well as with the tax reduction, the return on capital invested by the owner. The relaxation of the monetary policy of the state in the form of interest rate cuts on loans provided to non-financial corporations and improved availability of loans meant a gradual reduction of corporate financial burdens. The interest burden measured by the interest paid on pre-tax profit and interest (I / EBIT) decreased from 11.78% to 2.93% over the monitored years. In Czech banks, the decline in interest burden was much more pronounced from 63.51% to 33.06%.

**Table 6A. Development of interest reduction and creditors' share in the profit of an average Czech industrial business**

Year	EBT	EBIT	IB	I%	I	I/EBIT	D	D/A	ROA %
2007	x	x	x	5.10	x	x	x	x	x
2008	322	365	0.88219	4.80	43	0.11781	2156	0.48125	8.15
2009	312	336	0.92857	3.72	24	0.07142	2391	0.48696	6.84
2010	332	351	0.94586	3.47	19	0.05413	2456	0.43396	7.06
2011	318	338	0.94082	2.86	20	0.05917	3001	0.52538	5.92
2012	416	433	0.96074	2.61	17	0.03926	2873	0.49662	7.48
2013	389	407	0.95577	2.26	18	0.04422	3325	0.52083	6.37
2014	385	402	0.95771	2.22	17	0.04228	3365	0.52202	6.24
2015	431	444	0.97748	1.74	13	0.02928	3237	0.50704	6.95

Source: own calculation based on the data of the MIT CR (2016)

It is clear from Tables 6A and 6B that in the past eight years there has been a significant fall in the interest burden on the Czech banking sector, both in absolute terms and in relative terms. The share of operating profit<sup>8</sup> produced by the analysed entities attributable to creditors declined in absolute terms during the period from 2008 to 2015 from CZK 94 billion to CZK 40 billion. As a result, banks generated resources to potentially increase their capital resources of CZK 66 billion in 2015 compared to CZK 46 billion reported in 2008. Debt (D) rose in absolute terms compared to the starting year, and total indebtedness (D / A) developed in addition to the opposite value of the financial leverage.

To examine the impact of interest rate on the on the interest burden of loans (see Tables 6A and 6B), we will use the estimates of corresponding regression models. The relationship between the proportion of interest paid on profits and the interest rate depicts Table 7.

**Table 6B. Interest reduction and creditors' share in the profit of an average Czech bank**

Year	EBT	EBIT	IB	I%	I	I/EBIT	D	D/A	ROA %
2007	x	x	x	5.10	x	x	x	x	x
2008	54	148	0.36486	4.80	94	0.63513	3752	0.92779	3.66
2009	71	141	0.50000	3.72	71	0.50000	3774	0.92183	3.47
2010	66	128	0.51562	3.47	62	0.48437	3846	0.91833	3.06
2011	63	125	0.50400	2.86	62	0.49600	4113	0.91911	2.79
2012	77	139	0.55395	2.61	62	0.44604	4206	0.90783	3.00
2013	73	121	0.60330	2.26	49	0.40495	4679	0.90995	2.35
2014	76	124	0.61290	2.22	48	0.38709	4797	0.90356	2.33
2015	81	121	0.66942	1.74	40	0.33058	4941	0.90362	2.21

Source: own calculation based on the data of the CNB (2016)

**Table 7. Estimates of interest rate and interest burden dependency**

	I/EBIT bank <sub>(bs)</sub>				I/EBIT corporations <sub>(is)</sub>		
	Lag	Coefficient	Coefficient of determination	KPSS residual test	Coefficient	Coefficient of determination	KPSS residual test
Interest rate	0	0.0174	0.072	> 0.100	0.0263 ***	0.885	> 0.100
	1	0.0218	0.140	> 0.100	0.0224 ***	0.800	> 0.100
	2	0.0530 ***	0.803	> 0.100	0.0112 ***	0.746	> 0.100

Note: \*, \*\* and \*\*\* indicate the statistical significance of the regression coefficient at 10%, 5%, and 1% significance level respectively. Standard errors were calculated using the robust standard errors (Newey-West estimator). The KPSS test results correspond to the p-value of the unit root test of the residuals from each regression. In all cases, residuals can be considered as stationary.

<sup>8</sup> This is the absolute amount of the generated profit after deducting the total losses reported by corporations in those years.

In the case of the relationship between the interest rate and the share of interest paid on EBIT (interest burden), a statistically significant effect of changes in the interest rate on this characteristic is present especially in the case of Czech industrial corporations. The most important influence stems from the non-delayed interest rate that explains 88.5% of the variability in the dependent variable. In the case of banks, this effect is inconclusive and manifests itself significantly with a lag of two years. In this case, it explains more than 80% of the variability of the  $I / \text{EBIT}$ .

### 3. Results and discussion

A corporation does not begin to form Economic Value Added (EVA) for owners (Kislingerová, Neumaierová 2000; Kislingerová et al., 2010) until the return of their invested capital exceeds the alternative cost (profitability).<sup>9</sup> The main factor affecting return on equity is, according to DuPont's second equation, return on sales (EBIT/S), which should be positive, with EBIT growing faster than sales ( $I_{\text{EBIT}} > I_S$ ). For the sample survey, this requirement was only met in 2012, 2014 and 2015, as shown in Table 4. The impact of the interest rate cut, resulting in average annual growth of the EBT of 2.69% and the tax cuts, which together resulted in the average annual growth of net profit of 3.49% (see Table 8A) reflected positively. The index of average growth of disposable income of an industrial corporation due to a reduction in the financial burden (after eliminating the impact of EBIT change) was 2.03%. Much higher growth indices were achieved in the banking sector (see Table 8B). Also, the earnings growth indices listed in Tables 8A and 8B should meet the inequality:

$$I_{\text{EAT}} > I_{\text{EBT}} > I_{\text{EBIT}} \quad (5)$$

The asset turnover, which supports the ROA indicator, behaves similarly, if it grows, while the growth index should fulfil the condition  $I_S > I_A$ . The last factor is the financial leverage, which reflects the influence of the involvement of foreign capital on the financing of a corporation and shows a changeable character.

**Table 8A. The indexes of the growth rates of basic indicators for industrial corporations**

Index	2008	2009	2010	2011	2012	2013	2014	2015	Average
$I_A$	1.061	1.096	1.012	1.148	1.013	1.103	1.010	0.990	5.41 %
$I_E$	1.029	1.084	0.999	1.077	1.074	1.050	1.007	1.021	4.26 %
$I_S$	1.035	0.891	1.091	1.125	1.027	0.999	1.043	1.040	3.14 %
$I_{\text{EBIT}}$	0.877	0.920	1.044	0.963	1.281	0.940	0.988	1.104	1.46 %
$I_{\text{EBT}}$	0.843	0.969	1.064	0.987	1.308	0.935	0.990	1.119	2.69 %
$I_{\text{EAT}}$	0.844	1.004	1.111	0.946	1.333	0.921	0.997	1.123	3.49 %

Source: own calculation based on the data of the MIT CR (2016)

<sup>9</sup> The economic added value is determined from the relationship  $\text{EVA} = (\text{ROE} - r_e) * E$  or  $\text{EVA} = \text{EAT} - E * r_e$ .

**Table 8B. The indexes of the growth rates of basic indicators for the banking sector**

Index	2009	2010	2011	2012	2013	2014	2015	Average
I <sub>A</sub>	1.012	1.023	1.068	1.035	1.110	1.032	1.030	4.49 %
I <sub>E</sub>	1.096	1.069	1.058	1.179	1.084	1.106	1.029	8.89 %
I <sub>S</sub>	1.016	0.992	0.979	1.017	0.951	0.991	0.969	-1.19 %
I <sub>EBIT</sub>	0.959	0.901	0.976	1.112	0.870	1.024	0.976	-2.56 %
I <sub>EBT</sub>	1.315	0.929	0.954	1.222	0.948	1.041	1.065	6.80 %
I <sub>EAT</sub>	1.304	0.933	0.946	1.207	0.953	1.033	1.047	6.07 %

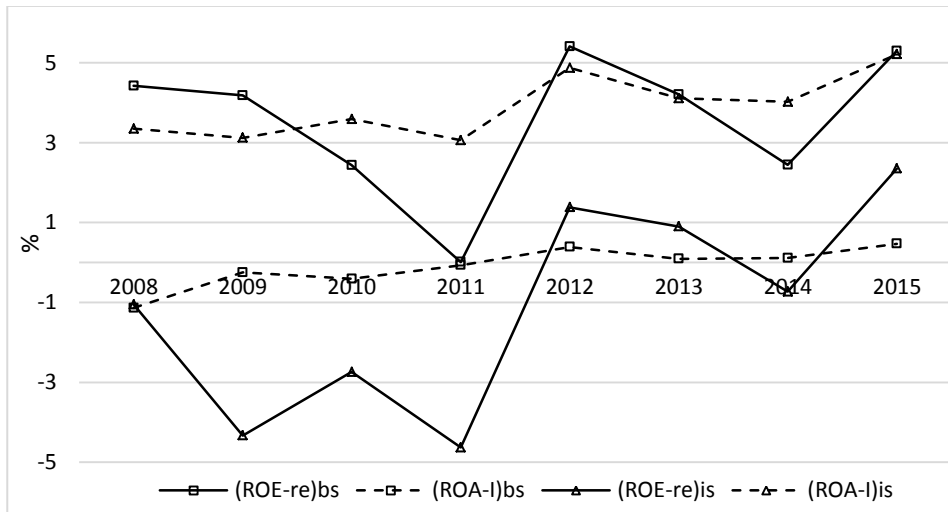
Source: own calculation based on the data of the CNB (2016)

The moment from which the average corporation starts to generate value for the owners results from Figure 3, which compares the ROE indicator with the alternative return on equity ( $r_e$ ), it is the so-called spread in the meaning of the difference, range or range of two variables.

The generation of economic added value occurs throughout the monitored period, in which return on equity exceeds the investors' expected return on capital and is located in the area where the inequality  $(ROE - r_e) > 0$  is applied. Industrial corporations, unlike banks, did not reach a positive spread until 2012, 2013 and 2015.

The return on total assets in the industrial sector, which is well above the cost of foreign capital throughout the monitored period, is also beneficial, and it is worthwhile for companies to get more capital into their financing as the increase in indebtedness is already helping to improve profitability for owners. The differences between the values of the return on total capital of the average bank and the prices of the foreign capital (spread) are summarised in Tables 9A and 9B showing a gradual increase in the spread  $(ROA - I\%)$  to positive values from 2012.

**Figure 3. The comparison of the economic added value and rate of interest burden**



Source: own calculation based on the data of the MIT (2016) and CNB (2016)

**Table 9A. Development of the spread of the average Czech industrial corporation**

Indicator	2008	2009	2010	2011	2012	2013	2014	2015
ROE	10.03	9.29	10.33	9.07	11.26	9.87	9.77	10.74
$r_e$	11.08	13.62	13.07	13.70	9.88	8.97	10.50	8.39
ROE - $r_e$	-1.05	-4.33	-2.74	-4.63	1.38	0.90	-0.73	2.35
ROA	8.15	6.84	7.06	5.92	7.48	6.37	6.24	6.95
l%	4.80	3.72	3.47	2.86	2.61	2.26	2.22	1.74
ROA - l%	3.35	3.12	3.59	3.06	4.87	4.11	4.02	5.21

Source: own calculation based on the data of the MIT CR (2016)

**Table 9B. Development of the spread of the average Czech bank**

Indicator	2008	2009	2010	2011	2012	2013	2014	2015
ROE	15.75	18.75	16.37	14.64	14.99	13.17	12.31	12.52
$r_e$	11.33	14.57	13.94	14.63	9.58	8.97	9.86	7.23
ROE - $r_e$	4.42	4.18	2.43	0.01	5.48	4.20	2.44	5.29
ROA	3.66	3.47	3.06	2.79	3.00	2.35	2.33	2.21
l%	4.80	3.72	3.47	2.86	2.61	2.26	2.22	1.74
ROA - l%	-1.14	-0.25	-0.41	-0.07	0.39	0.09	0.11	0.47

Source: own calculation based on the data of the CNB (2016)

## Conclusions

Following the financial and economic crisis that hit the global economy in 2009, the performance of the Czech economy is slowly increasing. This development was positively supported by the easing of macroeconomic policy (lowering of the interest rates of loans and a low tax rate on corporate income), the phase of economic growth and the strengthening of the supply side of the economy. Corporations could create a new financial structure in line with the capital structure to keep the value for their own development after separation of part of the profit for creditors and the state.

The analysis showed the almost immediate impact of changes in the statutory tax rate on the tax burden on industrial corporations and, on the other hand, the gradual approximation of the effective tax burden on the banking sector to the statutory tax rate during 2008 to 2015. From the interest burden, an almost instantaneous impact of changes in the interest rate can be observed for the industrial sector, whereas in the case of the banking sector the effects of interest rate changes on the interest burden are reflected with a two-year delay. From this point of view, the efforts of the economic policymakers in the area of reducing the tax burden on legal entities seem very effective and almost immediately manifest themselves in the effective burden of industrial corporations. In addition, the declining statutory tax rate is reflected (with a two-year delay) in adapting the effective taxation of banks to this statutory tax rate. From monetary policy, the immediate impact on setting monetary policy (as measured regarding changes in the market interest rate) on the interest burden of corporations is also evident.

Growth in value for owners was also contributed to by a reduction in the interest burden, which cut 8.17% off the gross profit of industrial corporations, dropping to 2.93% and a decrease from 63.51% to 33.06% for banks. This trend will not be so pronounced in the following quarters, as macroeconomic forecasts predict a gradual rise in interest rates. The development of the tax burden in the banking sector shows the opposite trend,

the EBIT state contribution rose from the original 5.41% to 12.39%, due to a significant decline in bank output and practically constant income tax rates. In the industrial sector, the tax burden was reduced from 24.38% to 20.94%, which supported the growth trend of both ROA and ROE curves. In the near future, a further increase in tax burden can be expected due to the progressive taxation discussed in selected sectors of the economy.

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