

ENTREPRENEURSHIP AND TAXATION: RELATIONSHIP BETWEEN THE CORPORATE TAX RATE AND THE NEW BUSINESS FORMATION IN THE CZECH REPUBLIC

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Abstract

Economic and tax policies are important factors for shaping the regional entrepreneurship ecosystems. The tax policies may affect the decision of foreign and domestic entrepreneurs to establish their own business activity, because taxes are part of the costs, which entrepreneurs have to pay regularly. In a tax-competitive world, business founders, may easily register their companies in tax paradises, offering them zero or low corporate tax rates. Policy makers may adjust the tax policies by lowering taxes, with expectations of the increase in new business registrations. The objective of this study was to quantify the relationship between the corporate income tax rate and the new business formation in the Czech regions, during the period of years 2000-2015. To investigate the relationship, panel regressions with fixed effects were estimated. Obtained results, controlled for the traditional determinants of entrepreneurship, proved statistically significant negative influence of the tax rate on the new business formation. This finding has important implications for the Czech policy makers.

Key words: Entrepreneurship, Business Companies, Determinants of Entrepreneurial Activity, Tax Burden, Corporate Tax, the Czech Republic

JEL Code: M2, M1, L260

Introduction

Entrepreneurship scholars still identify many research challenges in investigation of the determinants of entrepreneurial activity (Carbonara et al., 2016 or Dvouletý, 2017b). When choosing entrepreneurial career, individual's choices are affected by the regional business environment (Šebestová et al., 2016 or Dvouletý and Mareš, 2016b) and by the various entrepreneurship policies (Dvouletý and Lukeš, 2016). One important factor, shaping the regional entrepreneurial ecosystem is the country's tax policy. Balamoune-Lutz and Garello (2014) point out that tax regulations and tax rates are among the most problematic

issues for doing business in European Union. They further point out that policy makers should think of potential impact of the changes in the tax structure on entrepreneurial activity. Higher tax rates may discourage individuals from starting a business, because taxes reduce one's personal income. Balamoune-Lutz and Garelo (2014) collected panel of 36 European countries for the period 2000-2008 and based on the econometric estimates they conclude that the tax progressivity has negative influence on the new business formation. Belitski et al. (2016) followed up on their study and they analysed the influence of the corporate tax rate on the new business formation in 72 countries over the years 2005-2011. They have obtained a negative influence of the corporate tax rate on the new business formation. The Czech Republic was not analysed in any of the above mentioned studies. Czech entrepreneurship is still under-researched, despite the fact that Dvouletý (2017a) has recently proved a positive influence of new business formation on the Czech regional GDP and he has also found negative impact of entrepreneurship on regional unemployment rate. According to author's own research, nobody has ever tried to analyse the relationship between the tax structure and the new business formation in the Czech Republic. Therefore the following study aims to fill in a local research gap and based on the previously published studies, it assumes a negative influence of the corporate tax rate on the formation of new business companies. The tested hypothesis is formally stated below:

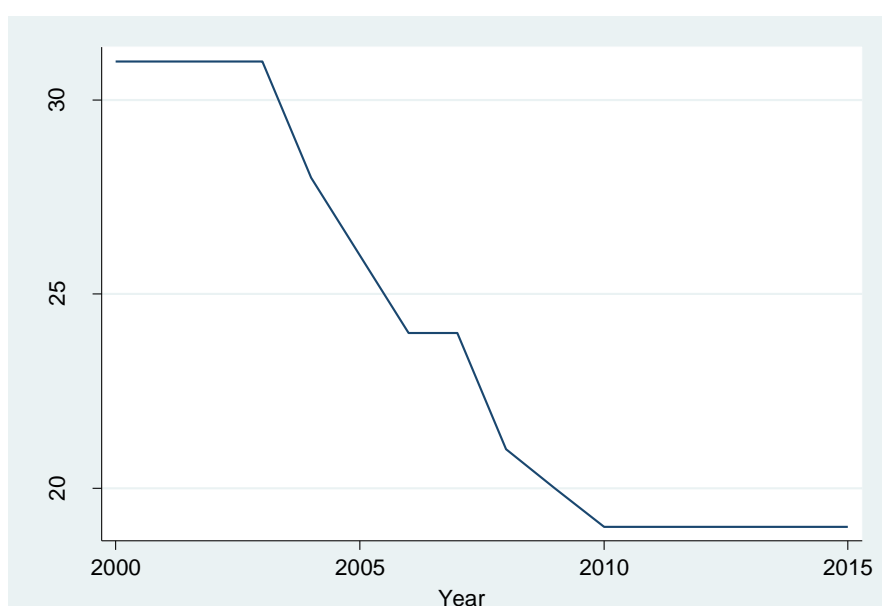
- **H₁**: There was a negative relationship between the corporate income tax rate and the new business formation in the Czech regions, during the period of years 2000-2015.

1 Data

Data were collected from the various databases and represent a panel of the 14 Czech NUTS III regions over the period of years 2000-2015. The variable of interest (dependent variable) in the analysis represents the number of newly established business companies, which was obtained from the Czech Statistical Office (2017). From the Czech Statistical Office (2017) was also gained the variable representing the number of inhabitants. To ensure the comparability of the data across the Czech regions, the dependent variable was calculated per capita (*New Business Companies per Capita*). The highest rates of new business formation were observed in the Capital Prague, political and business centre of the Czech Republic, as it has been previously mentioned by Dvouletý (2017a) or by Hamplová and Kovárník (2016). To make sure that the obtained results are not biased by an outlier, control regression models without the region Prague were estimated. It was found that the presence of the region in the analysis does not

influence the obtained coefficients. Therefore the region was kept in the analysis, as it is consistent with the findings of Dvouletý and Mareš (2016a). Corporate Income Tax Rate was obtained from the OECD database (2017) and it is denominated in percentages. The highest tax rate was during the analysed period in year 2000 (31%) and it decreased over the time substantially. From year 2010, the corporate tax rate remains at 19%. The development of the corporate tax rate over the time can be seen in Figure 1 below.

Figure 1: Development of the Corporate Tax Rate during Years 2000-2015



Source: STATA 14, own elaboration

The influence of the corporate tax rate is controlled for the impact of additional determinants of entrepreneurship. Population density (*Population Density*), percentage share of economically active population aged 15-64 years (*Economically Active Population*), number of business R&D workplaces per thousand of inhabitants (*Workplaces R&D Rate*) and GDP per capita in CZK (*GDP per Capita*) were also obtained from the Czech Statistical Office (2017). GDP per capita had to be adjusted for inflation, with usage of the GDP Deflator with the base year 2010. GDP per capita has also been converted into the form of natural logarithm, as it is common for financial variables (Verbeek, 2012). Number of new patent applications was used as a proxy for the regional innovation activity and the variable was obtained from the Czech Industrial Patent Office (2017). The last control variable accounts for the recent economic crisis which took a place during the period of years 2008-2010 (*Economic Crisis 2008-2010*). Table 1 presents the summary statistics of the collected dataset.

Tab. 1: Summary statistics

Variable/Statistics	Mean	Std. Dev.	Minimum	Maximum	Observations
<i>New Business Companies per Capita</i>	.001	.004	.002	.024	182
<i>Corporate Income Tax Rate</i>	23.813	4.951	19	31	224
<i>Population Density</i>	288.632	601.490	62.109	2554.531	224
<i>Economically Active Population</i>	69.735	1.626	65.270	72.280	223
<i>Patent Applications Rate</i>	.063	.0451	.005	.252	224
<i>Workplaces R&D Rate</i>	.213	.110	.053	.549	140
<i>Real GDP per Capita</i>	326826.89	122363.76	216770.69	848266.76	210

Source: STATA 14, own elaboration

2 Regression Analysis

Empirical regression analysis is employed to quantify the relationship between the corporate income tax rate and the new business formation in the Czech regions, during the period of years 2000-2015. Since the data were formed into a panel, all variables need to be inspected for the stationarity. Levin, Lin & Chu unit root test has found all collected variables to be stationary and therefore they may be used in regression models. Region-fixed effects were applied to control for the interregional heterogeneity, as the regions are quite stable over time. Econometric models were estimated with the robust standard errors which are consistent against the consequences of autocorrelation and heteroscedasticity. Level of collinearity among independent variables was tested by the Variance Inflation Factors test and all values were below the generally tolerated threshold. Both estimated models which are depicted in Table 2 were found to be statistically significant and they have quite good explanatory power of the dependent variable in terms of R-Squared (Verbeek, 2012).

2.1 Interpretation of Results¹

The crucial coefficient for the variable representing corporate income tax rate was found to be negative and statistically significant both on the level (Model 1) and with up to one year lag (Model 2). Therefore the presented coefficients support the stated hypothesis (**H₁**) about the negative relationship between the corporate tax rate in the Czech Republic and the new business formation during the analysed period of years 2000-2015. Negative influence of the corporate tax rate was recently reported in the study by Belitski et al. (2016) and it is also supported by the economic theory.

Obtained coefficients for the control variables were also quite in the line with the previously published studies on the determinants of entrepreneurship, despite the fact that not

¹All variables are interpreted following formula *ceteris paribus*.

all variables were found to be statistically significant. Statistically significant positive influence was obtained for the variables representing population density and share of economically active population. The positive influence of population density was recently obtained for the business companies by Dvouletý and Mareš (2016a), who found that the business companies are mostly founded by entrepreneurial teams and concentrated in the population-denser areas. The variable representing the economic crisis supported the theory of necessity entrepreneurship showing, that during the period of economic recession (2008-2010), the individuals started business companies in the Czech regions more often, compared to other years, as it has been recently proved by Dvouletý and Mareš (2016b) in their study focused on the determinants of entrepreneurial activity in the Visegrad region. Obtained positive coefficients for innovation activity may be supported by Lukeš (2013) who points out that entrepreneurs are historically bearers of innovative behaviour. Increase in GDP per capita/economic growth may deliver entrepreneurs new business opportunities and to motivate them to establish a new enterprise (Dvouletý, 2017b or Carbonera et al., 2016).

Tab. 2: Estimated Econometric Models with Fixed Effects for Years 2000-2015

Model	(1)	(2)
Independent Variables/Dependent Variable	<i>New Business Companies per Capita</i>	
<i>Corporate Income Tax</i>	-0.000550** (0.000149)	
<i>Corporate Income Tax (-1)</i>		-0.000378** (0.000102)
<i>Population Density</i>	0.0000382*** (0.00000561)	0.0000384*** (0.00000519)
<i>Economically Active Population</i>	0.00102*** (0.0000822)	0.000903*** (0.0000645)
<i>Patent Applications Rate</i>	0.00521 (0.00821)	0.00197 (0.00737)
<i>Workplaces R&D Rate</i>	0.00840 (0.00938)	0.00903 (0.00902)
<i>Log GDP per Capita</i>	0.00218 (0.00216)	0.00255 (0.00216)
<i>Economic Crisis 2008-2010</i>	0.0000176 (0.000412)	0.000821** (0.000254)
<i>Constant</i>	-0.0906** (0.0293)	-0.0906** (0.0293)
Observations	140	140
R²	0.682	0.688
Adjusted R²	0.665	0.672
AIC	-1554.3	-1557.1
BIC	-1533.7	-1536.5

Models were estimated with robust standard errors and region-fixed effects. Standard errors are in parentheses.

Statistical significance: * p < 0.05, ** p < 0.01, *** p < 0.001.

Source: STATA 14, own elaboration

Conclusion

Current entrepreneurship scholars investigate the relationship between the corporate income tax rate and the new business formation. It has been found that the relationship has never been analysed in the Czech entrepreneurial environment. Based on this identified research gap, data for the Czech NUTS III regions, covering the period of years 2000-2015 were collected. To investigate the relationship, panel regressions with region-fixed effects were estimated. Obtained results, controlled for the impact of the traditional determinants of entrepreneurship, proved statistically significant negative influence of the corporate tax rate on the formation of new business companies.

The substantial reduction of the corporate tax rates during the past years in the Czech Republic was therefore associated with an increase of the new business companies. If the main objective of the Czech policy makers is currently to boost entrepreneurship, then other changes in the corporate tax rates might be discussed. Policy makers should have in their minds, that today's world is very tax-competitive, and that keeping the high levels of corporate taxes may discourage investors to start a business in the Czech Republic.

The presented study analysed only the influence of the corporate tax rate on the formation of new business companies. Forthcoming research in the Czech Republic should analyse the influence of the self-employment tax policies on the new self-employment activity.

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