

# ENTREPRENEURSHIP AND CORRUPTION: DO CORRUPTION PERCEPTIONS INFLUENCE REGIONAL ENTREPRENEURIAL ACTIVITY?

Ondřej Dvouletý – Ivana Blažková

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## Abstract

William Baumol (1990) argued decades ago that corruption may negatively influence not only entrepreneurial and innovation activity, but also regional economic development since there is a tight link between entrepreneurship, innovation and national wealth. Increasing level of corruption may discourage some people to start a business. Therefore it is important to control the level of corruption continuously. In this study, we utilise data from Transparency International together with other data sources, and we quantify the relationship between the corruption perceptions and the regional entrepreneurial activity in the Czech Republic. We analyse years 2000-2015, and we operationalise regional entrepreneurship by the two rates: the rate of business companies per capita and rate of self-employed persons per capita. The estimated panel regressions empirically support a hypothesis about the negative impact of corruption on both types of regional business activity. Based on these findings, we recommend policymakers to put more efforts into controlling and decreasing the level of corruption.

**Key words:** Corruption Perceptions, Determinants of Entrepreneurial Activity, Regional Entrepreneurship and Self-employment, the Czech Republic

**JEL Code:** M2, M1, L260

## Introduction

Governmental institutions and their efficiency are important factors shaping the regional entrepreneurship ecosystem (e.g., Belitski et al., 2016; Dutta and Sobel, 2016; Šebestová et al., 2016). William Baumol (1990) argued decades ago that the overall governmental efficiency and level of corruption might influence the structure of the entrepreneurial activity. Scholars (e.g., Dilli et al., 2018; Dvouletý, 2018; Fritsch and Storey, 2014) also point out that structure of entrepreneurial activity is very important, because not all forms of entrepreneurial activity aim to positively affect the economic growth. Thus, it is important to distinguish between different forms of entrepreneurship and self-employment (e.g., necessity

entrepreneurship, high-growth entrepreneurship, social entrepreneurship and cultural entrepreneurship) also in their relation to the regional economic development. Going back to the theory of institutions, in case of high level of corruption and inefficient public institutions, an increase of harmful, unproductive and destructive entrepreneurship might occur and have an even negative impact on the regional economic development (e.g., Mohamadi et al., 2017; Dvouletý, 2017). This might especially be a case of developing and transition countries, undertaking frequent changes in the institutional environment. Post-communist countries of Central and Eastern Europe (CEE), that have experienced the process of economic transition two decades ago, are not an exception as Sicakova-Beblava and Beblavy (2016) together with Lízal and Kocenda (2001) point out. Taking into account these arguments, we aim to provide an empirical evidence on the relationship between the corruption perceptions and regional entrepreneurial activity in the Czech Republic. We believe that the study fills in a regional research gap from the perspective of an emerging economy. Following the previous studies (e.g., Boudreaux et al., 2018; Dutta and Sobel, 2016), we assume a negative impact of corruption on the regional entrepreneurial activity. The tested hypothesis is formally stated below:

- **H<sub>1</sub>**: Higher corruption perceptions were negatively associated with the entrepreneurial activity in the Czech regions during the period of years 2000-2015.

## 1 Data

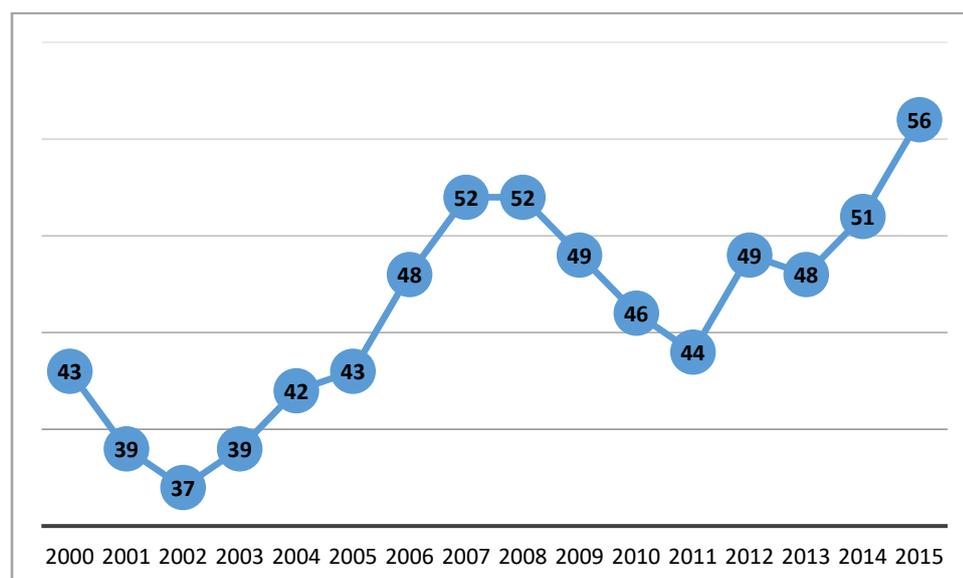
Our empirical exercise is based on a regional panel dataset that includes 14 Czech NUTS III regions over the years 2000-2015. The data come from several publically available sources. The main variables of interest cover the annual rate of entrepreneurial activity. Following the previous research (e.g., Dilli et al., 2018; Dvouletý, 2017; Dvouletý and Mareš, 2016), we work with the two forms of entrepreneurship and self-employment, rate of business companies and partnerships per economically active population 15-64 years (*Rate of Business Companies and Partnerships*) and rate of self-employed individuals per economically active population (*Rate of Self-employed Individuals*). These variables, including the number of economically active inhabitants, were obtained from the Czech Statistical Office database (2017).

The main variable of interest, representing the rate of corruption (*Corruption Perceptions Index*), was obtained from the Transparency International (2018). According to Transparency International (2018), the variable indicates “the perceived level of public sector

corruption on a scale of 0 (highly corrupt) to 100 (very clean).” Unfortunately, this variable was not available at the regional (NUTS III) level, and therefore, we use the national scores as a proxy for the regional corruption perceptions. Figure 1 shows that the corruption perceptions are improving over time, however, they still never reached the level of 60 points (leading Denmark historically scores over 90).

**Figure 1: Corruption Perceptions Development in the Czech Republic over 2000-2015**

(Scale of 0 = highly corrupt to 100 = very clean)



Source: Transparency International (2018), own elaboration

To make sure, that our estimates are not biased, we also take into account additional control variables taking into account some of the known determinants of entrepreneurship (see, e.g., Fritsch and Storey, 2014). We work with the new patent activity (*Patent Applications Rate*) that serves as a proxy for the regional innovation engagement. Variable was obtained from the Czech Industrial Patent Office (2017). We also control for the regional economic development operationalised by an unemployment rate (*Unemployment Rate*) and for the regional population density (*Population Density*). Both variables were obtained from the Czech Statistical Office (2017). Table 1 presents the summary statistics for the collected variables.

**Tab. 1: Summary statistics**

Variable/Statistics	Mean	Std. Dev.	Minimum	Maximum	Observations
<i>Rate of Business Companies and Partnerships</i>	.26	.02	.01	.15	224
<i>Rate of Self-employed Individuals</i>	.16	.02	.11	.23	224
<i>Corruption Perceptions Index</i>	46.13	5.25	37.00	56.00	224
<i>Unemployment Rate</i>	6.96	2.73	1.90	15.97	224
<i>Patent Applications Rate</i>	.06	.05	.00	.25	224
<i>Population Density</i>	288.63	601.49	62.11	2,554.53	224

Source: STATA 14, own elaboration

## 2 Empirical Analysis

To test our hypothesis, we employ a panel regression analysis and we quantify the relationship between the corruption perceptions and the regional entrepreneurial activity in the Czech Republic during the period of years 2000-2015. Following the classical econometric literature (Verbeek, 2012), we estimate our models with the robust standard errors that are consistent against the consequences of autocorrelation and heteroscedasticity. Level of collinearity among independent variables was tested by the Variance Inflation Factors (VIF) test and all values were below the generally tolerated threshold. To control for heterogeneity over time and across regions, we also include the region and year dummies. We begin our estimation with the impact of corruption perceptions on entrepreneurial activity only (Models 1 and 3), and then we include in the estimation also the control variables (Models 2 and 4). Finally, we use one hundred replications to report even more stable estimates. All four estimated models were found to be statistically significant, and we present them in Table 2.

### 2.1 Interpretation of Results<sup>1</sup>

From the presented estimates, we may see a positive and statistically significant relationship between corruption perceptions (*Corruption Perceptions Index*) and both types of entrepreneurial activity (*Rate of Business Companies and Partnerships* and *Rate of Self-employed Individuals*). This empirical observation supports the stated hypothesis suggesting that higher corruption perceptions were negatively associated with the entrepreneurial activity in the Czech regions during years 2000-2015 (please note, that the coefficient needs to be multiplied by  $*(-1)$  due to reversed values of corruption perceptions). The obtained finding is

<sup>1</sup>All variables are interpreted following formula *ceteris paribus*.

also in line with the recent empirical observations of the leading scholars in the field of entrepreneurship (e.g., Boudreaux et al., 2018; Dutta and Sobel, 2016 or Anokhin and Schulze, 2009), who conclusively claim that corruption may never be good for entrepreneurship. According to obtained empirical evidence, this is also true for the Czech Republic.

Estimated coefficients for the control variables also seem to be in accordance with the literature and previously obtained empirical evidence. When it comes to unemployment rate, the effect is statistically significant only for the rate of self-employed individuals who might especially use self-employment as a solution to temporary loss of employment during the times of economic decline (for more details on theory of necessity entrepreneurship, see for example recent study by Dvouletý et al., 2018). On the other hand, patent activity approximating boost of innovation seems to be positively associated with the rate of business companies and partnerships only (for a discussion on entrepreneurship and innovation, see for example Lukeš, 2013). Finally, Dvouletý and Mareš (2016) have shown that business companies and partnerships are more concentrated in the population-dense areas, contrary to self-employed individuals. We report similar findings.

**Tab. 2: Estimated Econometric Models with Region and Year Fixed Effects (2000-2015)**

<b>Model</b>	(1)	(2)	(3)	(4)
<b>Independent/Dependent Variables</b>	<i>Rate of Business Companies and Partnerships</i>		<i>Rate of Self-employed Individuals</i>	
<i>Corruption Perceptions Index</i>	0.00132*** (0.000323)	0.000918*** (0.000153)	0.00234*** (0.000139)	0.00267*** (0.000136)
<i>Unemployment Rate</i>		-0.0000912 (0.000145)		0.000687*** (0.000157)
<i>Patent Applications Rate</i>		0.0416* (0.0202)		-0.0305 (0.0193)
<i>Population Density</i>		0.000292*** (0.0000465)		-0.0000905*** (0.0000127)
<i>Constant</i>	0.0327* (0.0141)	-0.670*** (0.111)	0.102*** (0.00746)	0.311*** (0.0306)
<i>Year Dummies</i>	Yes	Yes	Yes	Yes
<i>Regional Dummies</i>	Yes	Yes	Yes	Yes
<b>Observations</b>	224	224	224	224
<b>R<sup>2</sup></b>	0.899	0.979	0.980	0.989
<b>Adjusted R<sup>2</sup></b>	0.885	0.975	0.978	0.987
<b>AIC</b>	-1527.3	-1868.2	-1847.2	-1967.4
<b>BIC</b>	-1428.4	-1759.0	-1748.3	-1858.3

Notes: Models were estimated with robust standard errors and are based on 100 replications. Estimated models include fixed effects for regions and years. Standard errors are reported in parentheses.

Statistical significance \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

Source: STATA 14, own elaboration

## Conclusion

Scholars have obtained systematic empirical evidence on the harmful effect of corruption on entrepreneurial activity and self-employment engagement (e.g., Boudreaux et al., 2018; Dutta and Sobel, 2016). Unfortunately, these empirical findings often lack evidence from developing countries and economies experiencing the process of economic transition. Therefore we aimed to contribute to the debate empirically by an investigation of the relationship between the corruption perceptions and regional entrepreneurial activity in the Czech Republic during years 2000-2015. The estimated panel regressions empirically support a hypothesis about the negative impact of corruption on both types of regional business activity.

These findings highlight the problem of corruption in the Czech Republic and identify it as a potential barrier to entrepreneurship development in the country. Therefore, we recommend policymakers to put more efforts into controlling and decreasing the level of corruption. Unfortunately, as Sicakova-Beblava and Beblavy (2016) show, the historically implemented anti-corruption policies have limited impact on the level of corruption in the CEE region. Therefore, we recommend policymakers to put more efforts into controlling and decreasing the level of corruption, given the threat of having prevailing harmful and unproductive entrepreneurship. From a methodological angle, it would be highly recommended to monitor also the regional level of corruption perceptions.

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## Contact

Ondřej Dvouletý

University of Economics in Prague

Department of Entrepreneurship, Faculty of Business Administration

W. Churchill Sq. 4, 130 67 Prague 3, Czech Republic

Email: [ondrej.dvoulety@vse.cz](mailto:ondrej.dvoulety@vse.cz)

Ivana Blažková

Mendel University in Brno

Department of Regional and Business Economics, Faculty of Regional Development and International Studies

Zemědělská 1, 613 00 Brno, Czech Republic

Email: [blazkova@mendelu.cz](mailto:blazkova@mendelu.cz)