RELATIONSHIP BETWEEN UNEMPLOYMENT AND ENTREPRENEURIAL ACTIVITY: EVIDENCE FOUND AMONG VISEGRAD COUNTRIES*

Ondřej Dvouletý – Jan Mareš

Abstract

Purpose: The following study is focused on the relationship between the registered business activity and unemployment rate in Visegrad countries over period of years 1998-2014. The aim of the research was to investigate whether in the periods of higher unemployment rate, individuals engage into entrepreneurial activity, no matter if they are opportunity or necessity driven entrepreneurs.

Design/methodology/approach: Empirical analysis was conducted on the data collected from national statistical offices, World Bank, Eurostat and other sources. Panel regressions with fixed effects were employed and econometric models with dependent variable registered businesses per economically active inhabitant were estimated to fulfil research aim.

Findings: The increase of unemployment rate led to increase of overall entrepreneurial activity. The positive impact on registered business activity was also found for GDP per capita, growth of share of population with tertiary education, growth of business freedom and growth of R&D expenditures. Negative relationship was confirmed for the amount of days required to set up business. Finally, the increase of registered business activity led to decrease of unemployment rate.

Research/practical implications: Results are relevant for entrepreneurship policy makers who should support activities promoting engagement into entrepreneurial activity, especially during times of economic recessions and higher unemployment rates in Visegrad countries. Another implication is that business environment and administrative barriers have significant impact on entrepreneurial activity, therefore any efforts aiming at reduction of administrative barriers for potential entrepreneurs should be definitely supported.

Originality/value: The empirical analysis was conducted based on the research gap in the studies related to the entrepreneurial activity in Visegrad countries.

Key words: registered business activity, level of entrepreneurial activity, entrepreneurship, unemployment rate, regression analysis

JEL Codes: M2, M1, L260

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Introduction

Entrepreneurship is nowadays perceived more than before as a factor significantly contributing to the economic development through innovation and creation of new employment opportunities and hence there is recent increase in research dedicated to entrepreneurship and its determinants (Grilo and Thurik, 2004). Political authorities expect decrease of unemployment rate and increase of economic growth from entrepreneurial activity. This year we celebrate 25 years of existence of the Visegrad Group that associates the Czech Republic, Hungary, Poland and Slovakia (V4) and therefore we devoted this study to investigation of relationship between entrepreneurial activity and unemployment rate as a contribution to future common development of our entrepreneurial policies, such as those focused on reduction of unemployment and promotion of entrepreneurship. According to Global Entrepreneurship Monitor (2016) on average 5.5 % of 18-64 population were involved in ownership or management of established business activity in V4 countries in 2011.

Different outcomes across countries and over time, when analysing relationship between entrepreneurship and unemployment rate were obtained by researchers (Baptista and Thurik, 2007) and such a study is still for V4 countries missing. Koellinger and Thurik (2012) argue, that when people lose jobs and unemployment rate is high, they may engage into entrepreneurial activity to make for living. Cueto et al. (2015) explain, that this effect works only in the cases when unemployment rate increases significantly, reducing regional employment opportunities. Fritsch et al. (2015) conclude on German data that new business registrations were positively associated with higher unemployment rate. To test these relationships, authors mainly use econometric approach and quantify effects with up to two years lags. The following hypothesis are therefore to be tested in this article:

H1: Higher unemployment rate is associated with higher level of entrepreneurial activity

H2: Higher level of entrepreneurial activity is associated with lower unemployment rate.

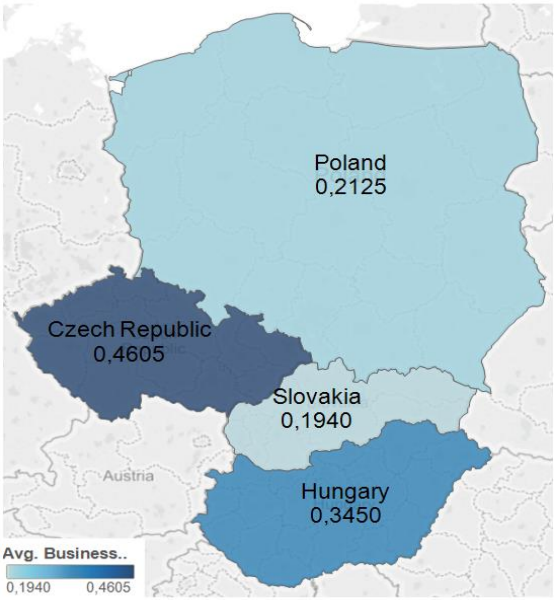
1 Data

Collected data were formed into a panel of four Visegrad countries covering period of years 1998-2014. The dependent variable is registered businesses per economically active inhabitant (*BUSINESS_ACTIVITY_EAP*), representing country level of entrepreneurial activity and was collected from national statistical offices of Visegrad countries[1]. We had to

[1] Central Statistical Office of Poland, Czech Statistical Office, Hungarian Central Statistical Office, Slovak Statistical Office (2016)

calculate rate of registered business activity, because population surveys, such as Global Entrepreneurship Monitor do not provide sufficiently long time series needed for econometric analysis. According to our calculated average rate of entrepreneurial activity, the highest rate was during examined period in the Czech Republic, followed by Hungary, Poland and Slovakia as can be seen on Figure 1. Number of economically active inhabitants used for calculation comes from Euromonitor database (2016).

Figure 1: Average rate of entrepreneurial activity in V4 countries over period 1998-2014



Source: Tableau, own elaboration

The main investigated explanatory variable, unemployment rate (*UNEMPLOYMENT_RATE)*, was obtained from Eurostat (2016). GDP per capita (*GDP_PER_CAPITA)* and amount of expenditures for research and development (*RD_EXPENDITURES)* in constant (2005) US dollars were collected from World Bank (2016). From the same source was collected share of tertiary educated population (*TERTIARY_EDUCATION).* Doing Business statistics contain time required to start a business in days (*DAYS_START_BUSINESS)*[2]. Business freedom index (*BUSINESS_FREEDOM_INDEX)*, part of Index of Economic Freedom was obtained from Heritage Foundation (2016). Descriptive statistics are presented in Table 1 below.

[2] Authors are familiar with the fact, that there are various legal forms of business entities and therefore the actual amount of days required to start business may differ. However since this indicator is comparable across V4 countries we use it as a proxy variable for bureaucratic barriers of potential entrepreneurs with all its limitations.

Tab. 1: Descriptive statistics

Variable	Mean	Median	Maximum	Minimum	Std. Dev.	Observations
BUSINESS_ACTIVITY_EAP	0.302978	0.255789	0.518496	0.149688	0.117113	68
BUSINESS_FREEDOM_INDEX	69.82500	70.00000	85.00000	53.70000	6.528957	68
DAYS_START_BUSINESS	26.94792	25.50000	103.0000	4.000000	18.44810	48
GDP_PER_CAPITA	11199.64	11044.74	15726.85	6241.784	2552.946	68
RD_EXPENDITURES	0.882928	0.820400	1.905250	0.449660	0.331663	64
UNEMPLOYMENT_RATE	10.79706	9.650000	20.00000	4.400000	4.407151	68
TERTIARY_EDUCATION	13.71618	12.95000	23.80000	7.700000	4.024685	68

Source: EViews, own elaboration

1.1 Stationarity of variables

Before we proceed to estimation of econometric models we need to make sure, that all variables are stationary, to avoid misleading spurious regression estimates (Verbeek, 2012). We tested all variables with Levin, Lin & Chu unit root test for panel data built in EViews software. Unfortunately, not all variables were found to be stationary at least on 10% level of statistical significance. Therefore variables *BUSINESS_FREEDOM_INDEX*, *RD_EXPENDITURES* and *TERTIARY_EDUCATION* had to be transformed into growth form. Additional testing confirmed their stationarity. The next section is dedicated to description of estimated econometric models.

2 Econometric analysis

Regression analysis is used to evaluate our stated hypothesis, mainly the relationship between registered entrepreneurial activity and unemployment rate. Econometric models were estimated in software EViews 8. As for estimation technique, fixed effects estimation approach was chosen, because our data set consists of states that generally do not change over time. Fixed effects approach was also confirmed, when we tested for redundancy of fixed effects and also by Hausman test. Violation of econometric assumptions in sense of autocorrelation and heteroscedasticity was solved by estimation with White cross-section standard errors & covariance (d.f. corrected). Level of collinearity among independent variables was controlled by Variance Inflation Factors test and normality of residuals was tested by Jarque Bera test of normality (Verbeek, 2012). We conclude, that presented models in Table 2 satisfy econometric assumptions and therefore may be used for interpretation.

2.1 Interpretation of results

The results of regression analysis are divided into two parts. Firstly, we investigated factors affecting level of entrepreneurial activity, that was set up as dependent variable and testing the

influence of unemployment rate (Models 1-7) and secondly, we quantified the impact of entrepreneurial activity on unemployment rate (Models 8-10) using up to two years lag. Models 1 and 5 confirmed statistically significant initial positive impact of unemployment rate on entrepreneurial activity with different control variables. Models 2 and 6 confirmed positive impact of unemployment rate on entrepreneurial activity lagged by one year and in Models 3 and 7 positive impact of unemployment rate lagged by two years. Hence **H1** is confirmed, concluding that higher unemployment rate was associated with higher level of entrepreneurial activity in V4 countries during analysed period. In the times of higher unemployment rate, entrepreneurship may become a solution for individuals who lost their jobs or better alternative opportunity in terms of earnings and other values.

Models 1-7 allow us to provide interesting findings about determinants of entrepreneurial activity. Our results proved statistically significant positive impact of growth of business freedom on entrepreneurial activity and on the other hand, negative impact of the amount of days required to set up business. Based on these findings, we conclude that business environment and administrative procedures matter and affect decision of current and potential entrepreneurs to engage into entrepreneurial activity or disengage from it. Growth of R&D expenditures positively affected entrepreneurial activity through mechanism of new scientific knowledge creating entrepreneurial opportunities that are exploited by entrepreneurs. Growth of tertiary educated population positively affected level of entrepreneurial activity in Visegrad countries, supporting argument, that individuals equipped with more resources tend to more likely engage into entrepreneurship. Higher GDP per capita positively influenced the level of entrepreneurial activity up to two years lag.

Models 8-10 investigated the impact of entrepreneurial activity on unemployment rate. Model 9 confirmed negative impact of entrepreneurial activity on unemployment rate lagged by one year and in Model 10 negative impact of entrepreneurial activity lagged by two years. In Model 8 we were unable to find statistically significant initial positive impact of entrepreneurial activity on unemployment rate, even the coefficient had negative sign. One explanation could be that it takes time to make newly established business operational and therefore it takes some time to hire new employees. Also, entrepreneurs would more probably firstly seek in the rows of employed professionals and then secondly in the crowds of those who are unemployed. It may take up to two years to decrease unemployment rate after increase of level of entrepreneurial activity. With this statement we support **H2**.

Tab. 2: Model table

Variable / Model	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
Dependent variable	*BUSINESS_ACTIVITY_EAP*							*UNEMPLOYMENT_RATE*		
UNEMPLOYMENT_RATE	**0.003387*** **			**0.000359**	**0.005946*** **					
	(0.000821)			(0.001591)	(0.001054)					
UNEMPLOYMENT_RATE(-1)		**0.003408*** **				**0.005756*** **				
		(0.000802)				(0.000948)				
UNEMPLOYMENT_RATE(-2)			**0.003292*** **				**0.005634*** **			
			(0.000649)				(0.000811)			
GDP_PER_CAPITA					**2.26E-05*** **					
					(1.09E-06)					
GDP_PER_CAPITA(-1)						**2.16E-05*** **				
						(1.11E-06)				
GDP_PER_CAPITA(-2)							**2.11E-05*** **			
							(1.13E-06)			
DAYS_START_BUSINESS	**-0.001532*** **	**-0.001524*** **	**-0.001517*** **							
	(0.000304)	(0.000280)	(0.000271)							
TERTIARY_EDUCATION_ GROWTH	**0.010559***	**0.015049** **	**0.020072*** **	**0.028519** **						
	(0.006045)	(0.006208)	(0.006905)	(0.013830)						
BUSINESS_FREEDOM_ GROWTH	**0.000770*** **	**0.001010*** **	**0.001023*** **	**0.000433**						
	(0.000112)	(0.000171)	(0.000188)	(0.000625)						
RD_EXPENDITURES_ GROWTH				**0.210802** **						
				(0.081484)						
BUSINESS_ACTIVITY_EAP								**-4.906641**		
								(5.771832)		
BUSINESS_ACTIVITY_ EAP(-1)									**-9.124414***	
									(5.118883)	
BUSINESS_ACTIVITY_ EAP(-2)										**-11.83753** **
										(5.870469)
CONSTANT	**0.320572*** **	**0.315232*** **	**0.311389*** **	**0.274032*** **	**-0.014884**	**0.005164**	**0.019474**	**12.28366*** **	**13.61416*** **	**14.35673*** **
	(0.011495)	(0.000171)	(0.014828)	(0.020675)	(0.020697)	(0.018984)	(0.017319)	(1.773000)	(1.527606)	(1.763602)
R-Squared	0.978961	0.979899	0.979684	0.917962	0.959410	0.966804	0.972721	0.579377	0.587543	0.576391
Adj. R-squared	0.975279	0.976382	0.976129	0.906918	0.956136	0.963943	0.970195	0.552671	0.559580	0.545583
F-statistic	265.8879	278.5686	275.5538	83.12180	293.0922	337.8427	385.1033	21.69446	21.01130	18.70915
Observations	48	48	48	60	68	64	60	68	64	60
Note: Standard Errors are in parenthesis *** stat. significance on 1 %, ** stat. significance on 5 %, * stat. significance on 10 %.										

Source: EViews, own elaboration

Conclusion

Presented article is dedicated to investigation of relationship between the registered business activity and unemployment rate in Visegrad countries over period of years 1998-2014. Following econometric approach we conclude that higher unemployment rate was associated with higher level of entrepreneurial activity in V4 countries during analysed period. These findings were stable with expansion up to two years lag of unemployment rate. Our findings support results of former scholars investigating the impact of entrepreneurship on unemployment rate. Results of econometric models were unable to statistically confirm initial negative impact of entrepreneurship on unemployment rate, however we were able to prove this effect with usage of lags one and two of entrepreneurial activity confirming negative influence of entrepreneurship on unemployment.

For future coordination of entrepreneurial policies of Visegrad countries we strongly support activities promoting engagement into entrepreneurial activity, especially during times of economic recessions and higher unemployment rates. Policy makers should be however familiar with fact that effect of entrepreneurship on unemployment rate may take up to one year, before it appears. Another implication of our results is that business environment and administrative barriers have significant impact on entrepreneurial activity. Therefore any efforts aiming at reduction of administrative barriers for potential entrepreneurs should be definitely supported.

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Contact

Ondřej Dvouletý

University of Economics in Prague

Faculty of Business Administration, Department of Entrepreneurship

W. Churchill Sq. 4

130 67 Prague 3

The Czech Republic

Email: ondrej.dvoulety@vse.cz

Jan Mareš
University of Economics in Prague
Faculty of Business Administration, Department of Entrepreneurship
W. Churchill Sq. 4
130 67 Prague 3
The Czech Republic
Email: jan.mares@vse.cz