EUROPEAN ECONOMIC INTEGRATION: ASSESSING BENEFITS FROM STATE SIZE PERSPECTIVE

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Abstract This empirical paper focuses on the analysis of economic benefits of European integration processes. A gap exists on the research that addresses the specific benefits of states involved in the economic integration processes. Thus, paper focuses on the analysis of benefits Slovenia has from European economic integration, and benchmark analysis is performed, taking Poland as example. This context serves for the comparison of effects and benefits of economic integration concerning smaller and larger states. Namely, there is an assumption that economic integration should have different state-specific effects, where state size is one of the attributes that significantly channels these effects. The results show that Slovenia benefited much more entering the single market in comparison to Poland. This suggests that single market might serve as an economic shelter for smaller states, and thus generates relatively larger benefits for them in comparison to larger states.

Keywords: European integration processes, single market, Solow-Swan model, small states, Slovenia.

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1 Introduction

The research presented on this paper deals with the analysis of country-specific analysis of the economic effects of European integration processes. According to the theoretical assumptions, economic integration should be beneficial for the economic growth of countries (or states, as labels can be used interchangeably) involved. This should be attributed mainly to the contributions of trade liberalization accompanied with the increased investments (Campos et.al., 2018). Substantial volume of the literature exists addressing the benefits of EU integration, in particular the stream concerned with the outcomes of the existence of the single market and common monetary policy (Henrekson et.al., 1997; Saia, 2017). This stream of literature stresses that benefits of integration exposed through these two achievements with the EU should be exposed particularly in the middle and long run, due to the abilities to exploit scale and scope economies, export specialization, knowledge and technology transfers etc. The empirics has shown that economic integration increases growth rates marginally up to 0.8 percent annually (Henreksson et.al., 1997).

However, the effect of integration has been heavily influenced by certain factors, including prevailing field of integration (i.e., services, goods, finance etc.), general level of economic development, level of institutional development and time of integration (Barro, 1991; Alesina and Spolaore, 1997). This indicates that the effects of integration are heavily individualized, which is further supported with the empirical studies that growth differential due to the integration is subjected to the structure of the economy, where financial sector and tourism are better off, whereas agricultural sector's performance is negatively affected by the integration usually (Armstrong et.al., 1998). Tumbarello et.al. (2013) have pointed out that initial level of development detrimentally effects the contribution of integration to the GDP. In contrast, political stability serves as a positive factor contributing to the beneficial effects of economic integration (Yang et.al., 2013).

Still, there is a lack of national-based studies that would robustly portray the effects of integration on economic performance. In this context, this study intends to bridge this gap. The purpose is to present the evidence on the assessment of the effects of integration on the economic performance, where we imply the small state perspective. This involves factors like vulnerability and volatility, as one of the real

concerns of small states is the size of the market (Bailes et.al., 2016). For those states, the export and market extension possibilities are particularly important, in order to go for scale and scope economies, although this further contributes to their exposure, influences volatility and strengthens the effects of external shocks.

Considering this, this study intends to integrate into research all small state studies. Research question relates to assessing the potential benefits of economic integration from the perspective of small state, where the benchmark is comparison to the extent of benefits of integration extrapolated by a larger state. The context here is the EU integration process, where this framework serves as a form of shelter, either economic, political or social.

2 Methodology and data

The empirical approach utilized has foundations in the Solow-Swan growth model (Solow, 1956; Swan, 1956), which represents one of the basic models for development of endogenous growth theory. This model often serves as basis for the estimation of growth variations and deviations among countries, as this approach assumes that growth rates are subjected to internal factors, where government subsidization of innovations and investments into human capital development result in larger productivity (Mankiw et.al., 1992). This model derives from the standard Cobb-Douglas production function, where Y denotes output, K physical capital, H human capital, L labor force, A the rate of technological development, whereas α and β represent output elasticity related to physical and human capital. The model is written as follows:

$$\mathrm{Y(t)} = K(t)^{\alpha}\, H(t)^{\beta} \left(A(t)L(t)\right)^{1-\alpha-\beta}.$$

This approach has two variants, static one and dynamic one. We utilize the dynamic version, where accommodations of the steady-state level are allowed and thus convergence can be estimated (Boulhol et.al., 2008). We estimate the effects of selected relevant macroeconomic variables on the real GDP growth rate for the period 1995-2018, where we apply linear regression analysis for the econometric modeling. Besides to the basic Solow-Swan model, we estimate also two extended versions of the model. The most extended model estimated is described as follows:

$$Growth_{t,i} = \beta_0 + \beta_1 log(y0_{t-1,i}) + \beta_2 K_{t,i} + \beta_3 EDU_{t,i} + \beta_4 TRADE_{t,i} + \beta_7 MIG_{t,i} + \beta_8 SINGLE_{t,i} + CRISIS_{t,i} + \varepsilon_{t,i}$$

Variables utilized in the analysis are presented in the table below.

Table 1: Variables used in the econometric modeling

Variable	Description	Data source
Growth	Real per capita GDP growth rate	World Bank (2020)
Log(y0)	Natural logarithm of real initial GDP per capita, PPP adjusted, t-1	World Bank (2020)
K	Net profitability of net capital	AMECO database, European Commission (2020)
EDU	Average years of education for population over 25 years of age	Barro and Lee (2013)
TRADE	Net trade as share of GDP	World Bank (2020)
MIG	Net migration rate per 1,000 residents	World Bank (2020)

The model includes the variable on the initial level of GDP, which serves to test the effects of convergence, as there is an assumption that the initial GDP negatively affects the GDP growth rate (Barro and Sala-i-Martin, 1992). Besides to standard variables for capital and education, we have added the variable on trade, which serves as a proxy for assessing the effect of economic openness. This enables benchmarks for variations in benefits between smaller and larger states, as this variable corresponds to one of the major differences between smaller and larger states, the former being implicitly relatively more open (Mann, 2015). We also add variable for migrations, as suggested by Golgher et.al. (2011), as this tends to have positive impacts on growth rates.

It is worth noting that the model includes also two additional dummy variables. First dummy variable is SINGLE, which corresponds to the single market entrance, so it implicitly assesses the effect of European economic integration. Thus, this variable has value 0 for the period 1995-2003, and value 1 for the period 2004-2018, after joining to the EU occurred. The second dummy variable is CRISIS, which has values 1 for the years 2007-2009, and 0 for other years. This variable is included to assess

different impacts of crisis on GDP growth, and the basis years for the Great Recession crisis are only taken into account.

Besides to Slovenia, which is considered a small state, we use data for Poland. Slovenia is small state, with approximately 2 million resident, whereas Poland is large state with almost 40 million residents. Both countries also differentiate substantially in the level of initial GDP, structure of the economy, but they have both joined the EU in 2004.

Finally, two determinants shape the selection of the period from 1995-2018. First, both state, i.e. Slovenia and Poland have experienced political and economic transformations in early 1990s, where socialist economic system was transformed into capitalist one, and initial variations in the output due to the transformation processes have been largely offset by the mid-1990s. Second, the reliability of data included in the analysis has thus increased substantially, and when including yearly data the time span analyzed becomes sufficiently large (Islam, 1995). Tables 2 and 3 below represent descriptive statistics for the variables for Slovenia and Poland.

Table 2: Descriptive statistics of variables for Slovenia

Variable	N	Min	Max	Average	Std. dev.
Log(y0)	24	4,107225	4,564083	4,35861353	0,136215956
K	24	77,621	132,243	104,78136	15,466693
EDU	24	11,23	12,52	11,8764	0,38754
TRADE	24	0,8217025	1,6002226	1,146521036	0,2559043438
MIG	24	–3,061604	19,497335	8,006967	5,923265

Table 3: Descriptive statistics of variables for Poland

Variable	N	Min	Max	Average	Std. dev.
Log(y0)	24	3,846775	4,479327	4,17706216	0,197163589
K	24	52,797	101,460	81,16944	19,124299
EDU	24	9,83	12,24	11,0583	0,72965
TRADE	24	0,365456	0,907026	0,63962552	0,171975752
MIG	24	–8,428254	–2,204392	–4,845405	1,708325

It is worth noting that this study intentions are purely empirical, focusing on modeling, and thus relations among specific explanatory variables are not studied in detail, as this goes beyond the intentions of the research.

3 Results and discussion

Table 4 presents the results of the three econometric models for Slovenia, where model 1 corresponds to the basic Solow-Swan model, and models 2 and 3 the extended versions of the model.

Table 4: Econometric modeling for Slovenia – results

M		B	Std. dev.	Stand. coef.	t	Sig (p)	$R^2_{adj.}$	F
1	**Constant**	3,305	1,319		2,506	0,021	0,602	12,597
	Log(y0)	–5,605	1,501	–2,453	–3,734	0,001		
	K	0,016	0,003	0,806	5,457	0,000		
	IZOB	1,658	0,525	2,064	3,160	0,005		
2	**Constant**	17,591	2,411		7,296	0,000	0,863	29,981
	Log(y0)	–10,585	2,288	–4,632	–4,626	0,000		
	K	0,015	0,002	0,743	8,446	0,000		
	EDU	2,100	0,764	2,615	2,750	0,013		
	TRADE	1,793	0,309	1,474	5,810	0,000		
	MIG	0,298	0,126	0,568	2,374	0,029		
3	**Constant**	17,770	2,150		8,264	0,000	0,897	29,681
	Log(y0)	–10,457	2,186	–4,576	–4,784	0,000		
	K	0,017	0,002	0,824	9,334	0,000		
	EDU	2,048	0,726	2,550	2,823	0,012		
	TRADE	1,460	0,323	1,200	4,525	0,000		
	MIG	0,245	0,112	0,465	2,183	0,044		
	SINGLE	0,244	0,135	0,387	1,809	0,089		
	CRISIS	–0,156	0,082	–0,170	–1,908	0,075		

The results of the econometric modeling for Slovenia show that all included explanatory variables have statistically significant effect on the dependent variable, although for dummy variables included the margin for statistical significance of the effect is liberally taken at 10 percent. We can clearly assume, based on calculations,

that convergence effect is the range from 5 to 11 percentage points, depending on the model interpreted. Namely, the extension of the basic Solow-Swan model has led to the increase of the regularity of econometric model, so the third one can be interpreted. Capital, education, trade and migrations positively contribute to the growth rate, and also dummy variable for single market entrance gives potential positive contribution to the growth rate, whereas crisis variable has negative impact on growth rate. This all corresponds to the theoretical predictions.

Table 5: Econometric modeling for Poland – results

M		B	Std. dev.	Stand. coef.	t	Sig (p)	$R^2_{adj.}$	F
1	**Constant**	13,483	5,063		2,663	0,015	0,223	3,203
	Log(y0)	–7,447	3,000	–8,721	–2,482	0,022		
	K	–0,009	0,006	–1,064	–1,669	0,111		
	EDU	1,701	0,734	7,373	2,317	0,031		
2	**Constant**	7,983	5,266		1,516	0,147	0,627	8,744
	Log(y0)	0,327	3,279	0,383	0,100	0,922		
	K	–0,004	0,005	–0,504	–0,966	0,347		
	EDU	–0,934	0,843	–4,047	–1,108	0,283		
	TRADE	3,172	0,686	3,240	4,624	0,000		
	MIG	0,054	0,024	0,553	2,286	0,035		
3	**Constant**	14,385	6,964		2,066	0,055	0,627	6,529
	Log(y0)	–3,597	4,302	–4,213	–0,836	0,415		
	K	–0,011	0,006	–1,228	–1,678	0,113		
	EDU	0,031	1,096	0,133	0,028	0,978		
	TRADE	2,767	1,061	2,826	2,608	0,019		
	MIG	0,038	0,028	0,381	1,342	0,198		
	SINGLE	0,007	0,138	0,019	0,047	0,963		
	CRISIS	0,129	0,095	0,259	1,354	0,194		

The results of the modeling for Poland indicate that the best fit of the variables can be found for the basic Solow-Swan model (1), as more or less all explanatory variables, except trade variable, become statistically insignificant in models 2 and 3. Interestingly, the existence of beta convergence for Poland in confirmed in model 1, where the affect is approximately 7.5 percentage points. This is larger than in the case of basic model for Slovenia (5.6 percentage points), which corresponds to the

fact that Polish economy is less developed than Slovene, so convergence effect should be larger.

A further note should be attributed to the results obtained in tables 4 and 5. Clearly, conditional convergence effect can be confirmed from the modeling, as it can be argued that less developed countries have greater growth potential than more developed states. Conditional convergence rate is smaller for Slovenia than for Poland, although this also indicates that both countries are still away from achieving steady state growth rates.

Given the purpose of the analysis, that is to scrutinize the integration effects in relation to the country size, an issue of volatility should be addressed. It is evident that EU integration was beneficial for Slovenia, and this can also be statistically confirmed, at least marginally. The same could not be verified for Poland, which somehow suggests that smaller, economically more open states benefit much more from economic integration. However, this integration has increased dependence on the single market, thus increasing both vulnerability and volatility, which effects of the crisis clearly indicated also empirically. The crisis has had substantially larger impact on Slovenia than on Poland, which accommodates to the implications delivered by Reuters (2016). Economic vulnerability of smaller states originates from larger openness and economic specialization of those states, as suggested by Easterly and Kraay (2000). This leads to much larger exposure of those states to external shocks.

However, some limitations of the current modeling and interpretations should be outlined. Although econometric modeling based on Solow-Swan approach recognizes its flexibility, rather short time span due to limited data availability emerging from short time series span causes potential existence of large cyclical components. Furthermore, as this is preliminary study, issues of causality and potential variable substitutions are not discussed in detail. This would be one of the suggestions for the potential future research. The results obtained indicate large sensitivity of modeling. Modeling for Slovenia was quite straightforward, but this does not hold for Poland. Nonetheless, this gives an implication that growth rates might be shaped by different country-specific factors, something already indicated in the introduction of the paper, so suggestion for further research is to amend Polish model.

4 Conclusion

The paper focuses on the empirical analysis of benefits Slovenia has from European economic integration, and benchmark analysis is performed, taking Poland as example. This context serves for the comparison of effects and benefits of economic integration concerning smaller and larger states, as both states have joined EU in 2004, but they are substantially different in size. The assumption is that economic integration should have different state-specific effects, where state size is one of the attributes that significantly channels these effects, mainly due to larger propensity for smaller states to be and remain open in economic terms. The results of the empirical analysis, based on the amended Solow-Swan model of economic growth, show, among others, that Slovenia benefited much more entering the single market in comparison to Poland. This suggests that single market might serve as an economic shelter for smaller states, and thus generates relatively larger benefits for them in comparison to larger states. It is worth noting that this is one of the rare studies trying to empirically verify economic benefits of integration, where the particular context of the small state is considered.

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