

PRODUCTIVITY EFFECT OF ACCESSING THE EU: CASE OF BULGARIA AND ROMANIA

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ABSTRACT

The article deals with the impact that the EU enlargement had on productivity of firms in accessing countries, particularly Romania and Bulgaria that accessed EU in 2007. Microeconomic data suggest that the impact of accession itself can be negative in a short run in case of countries that received promised benefits in disintegrated manner and also experienced problems with obliging requirements of EU accession that resulted in negative measures taken. The negative short run effect can hinder the benefits in the euphoria following the accession and therefore could be considered as part of accession process in certain situations.

KEY WORDS

Bulgaria, Romania, EU, enlargement, accession

JEL CODES

F15, F43, O19

1 INTRODUCTION

Multiple factors from various disciplines constitute a decision about both enlargement of union and joining it. The same is true for the European Union and cases of Bulgaria and Romania, two countries that joined the EU in 2007.

Economic analysis is just one part in the spectrum of political decision making that takes into account political, legal, cultural, economic and other reasons. Economics comes into play in reasoning about the potential benefits and costs

(as EU is particularly an economic area) prior to process of enlargement/joining, as well as ex post in evaluating the real effects the decision had.

In this article, I would like to argue the second case – what was the real benefit companies perceived in terms of their productivity when joined union of states that are mostly more developed than themselves. Because of availability of data and closeness of the event,

I would take into account short-term benefits and costs mostly, bearing in mind that the evaluation cannot be done without considering the potential long-term as well as other-than-economic benefits and costs as well. Also, it is important to bear in mind that productivity effects are just part of those economic factors that can be used for evaluation.

The contribution of this article lies in the empirical evaluation of short-term economic benefits or costs of the integration of Bulgaria and Romania into the EU for companies in these accessing countries. This article does not, however, consider any long-term and/or other-than-economic benefits/costs that might be linked to the integration process as well.

Therefore the research question in this paper is: “what is the effect of accessing the EU for firms” and the hypothesis: “accessing the EU is positively correlated with productivity of companies” with alternative hypothesis of null or negative correlation.

The integration of markets – done by enlargement of the EU – should have positive effect by trade theory and should eventually catch richer states (Solow, 1956), but in later years this proven to be problematic according to number of assumptions e.g. endogenous technological progress (Romer, 1986 and 1990), human

capital (Mankiw et al., 1992; Lucas, 1988), infrastructure (Barro, 1990) or divergence effect of infrastructure investment (Martin, 1998; Krugman, 1991).

Another of these assumptions, stressed by North (1990) is the relative similarity of countries with regards to institutional framework. The enlargement and accession are therefore not only economic (financial), but mostly political which, mostly in cases of central and eastern European countries, comprises also of adoption institutional structures of democratic, market-oriented western economies. These structures that can influence productivity of factors (Snowdon and Vane, 2005) are “rules of the game in a society, or more formally, are the humanly devised constraints that shape human interactions” (North, 1990, p. 3).

The enlargement of the EU does not consider only abolishment of formal trade barriers, but also accession to the internal market and free market of labour which are considered to be of larger effect than trade barriers themselves (Lejour et al., 2001). According to Lejour et al. (2001) new countries should benefit overall, but some sectors might shrink. The overall positive effect on economic growth (as well as convergence with old EU member states) is concluded by Rapacki and Próchniak (2008).

2 LITERATURE REVIEW

Situations of both countries were similar as talks of their accessions begin in early 90s by project “Returning to Europe” with some resistance as they didn’t want to be isolated from Soviet Union. Western Europe included them in trade programs and other programs that transformed the economies and allowed them to received significant amount of EU money. During early 90s they signed Association Agreement (1992), EU became their largest trade partner and they submitted their applications in 1995 (Noutcheva and Bechev, 2008).

Opposite to other CEE countries, Bulgaria and Romania were not performing on measures they were needed to implement unless sanctioned by either the market of the EU (mostly

by threat of postponing of cancelling the application). In Romania, problem was with political tests (it was elite-led country) and (the same as Bulgaria) economic tests (lack of structural reforms – privatization, cutting loss-making companies, problems with national currency), though political test in Bulgaria were alright (though Bulgaria experienced problems with inflation of 1997 and austerity measures imposed by IMF). Both countries experienced problems with implementation of measures as those were on paper but not put in practice – mainly in areas such as judiciary system, public administration and treatment of minorities – and therefore were not able to join 2004 enlargement (negotiations for their accession started 2 years later).

Date 2007 was set up at 2004 Brussels European Council (Noutcheva and Bechev, 2008).

Just a year before enlargement, Romania was considered provided better progress than Bulgaria, but in September 2006 European Commission recommended accession in January 2007 with condition of monitoring progress after accession (Noutcheva and Bechev, 2008).

Four years after accession both countries are still considered lagging due to corruption and judiciary. Bulgaria received significant funds as positive incentives and were threatened by their freeze (that was also done in practice) after 2007, but still had problems with government. In Bulgaria, the incentives of EU and domestic pressure are considered to help with corruption problem (Spendzharova and Vachudova, 2012).

Romania after 2007 responded only after pressure. It has still problems with corruption and even considered in 2010 that Romania breached its accession commitments. Some progress was done in judiciary area, but not enough. The problem, in contrast with Bulgaria, was that incentives were only external (by EU) but there was not enough domestic pressure and therefore results are mixed (Spendzharova and Vachudova, 2012).

Both countries were previously focused on agriculture and cheap labor and still as the GDP is growing, not so many benefits are visible – rising prices, loss of sovereignty, closure of inefficient industries (they also become net contributors to EU budget due to freezing of funds). The reforms are costly and difficult to achieve (Smilov, 2008 in Andreev, 2009) and they need another measures in order to be able to join Eurozone (Andreev, 2009).

3 METHODS AND DATA

Article uses econometric difference-in-differences methods with microeconomic data from Amadeus database (Bureau van Dijk, 2015) from A, B, C and G NACE Rev. 2 industries (those cover particularly wholesale, retail and manufacturing) observed over 10 years – 2004 to 2013 in both EU and non-EU countries in Europe. Monetary values are in thousands of EUR, unless stated otherwise and are merged with country data from Eurostat (Eurostat, 2015; unavailable data are imputed by the EU(28) average) for inflation (Producer prices NACE Rev. 2 Section C) and GDP.

The article estimates regression coefficients by OLS with panel data with fixed effects for companies and years and by multilevel estimations. The regression equation follows:

$$\begin{aligned} \text{TFP}_{it} = & \alpha + \beta_1 \text{EU}_{it} + \beta_2 \text{Labour}_{it} + \\ & + \beta_3 \text{Capital}_{it} + \beta_4 \text{GDP}_{it} + \\ & + \sum_{n=5}^8 \beta_n \text{Control}_{nit} + \\ & + \delta_i + \rho_t + \varepsilon_{it}, \end{aligned} \quad (1)$$

where i is the number of the company, t is the time, EU is dummy indicating whether company is in country that belonged to the EU in a given year, Labour is the logarithm of the number of employees, Capital is the logarithm of denominated fixed assets, GDP is the logarithm of denominated GDP, Control is the vector of control variables from financial analysis (logarithms of liquidity and leverage) and α , δ , ρ and ε are constant, company fixed effects, time fixed effects and error term respectively.

After panel OLS estimation, models are estimated also by multilevel modelling in order to consider different trend in individual states. Multilevel models are estimated using MLwiN software (Leckie and Charlton, 2013) with constant and year specifies at firm level and constant at country level while all the other variables are left in a fixed part of the model. Due to computing difficulties, lagging, leading and trends are omitted. Standard errors are counted using sandwich estimates in fixed part of the model.

Outliers of dependant variable (1st and 99th percentile) are not considered in analysis. Logarithms by neglog transformation (Whittaker et al., 2005) are used.

Dependant variable (Goedhuys and Srholec, 2015) is:

$$\text{TFP}_{it} = (\ln Y_{it} - \overline{\ln Y}) - \left(\sum_m \frac{1}{2} (\omega_{itm} + \overline{\omega_m}) (\ln I_{itm} - \overline{\ln I_m}) \right), \quad (2)$$

where i is the number of the company, t is time, m is input, Y is value added (or turnover), ω

is the cost share of input, I is input and the above lined are means of the overall sample. The depreciation values are real data, not guesses as in Goedhuys and Srholec (2015). The indicator is resistant to outsourcing and substitution of labour and capital.

Other variables used are numbers of employees and amount of fixed capital, GDP and liquidity and leverage of company (current assets divided by current liabilities and shareholder funds divided by assets respectively). Rentabilities as dependant variables are counted using profit before tax divided by capital or labour.

4 RESULTS

The main variable of focus is of course the EU variable that indicates whether observation is in the EU. As one observation indicates one company in a given year, it specifies whether the company belonged to country that was member of EU in a given year.

Bulgaria, Romania and Croatia are the only countries in which the EU variable differs. In case of Bulgaria and Romania it equals to zero up to 2006 and one from 2007. In the case of Croatia, zero till 2012 and one for year 2013. This article concerns only Bulgaria and Romania as in the case of Croatia it is not possible to observe any post-treatment trend. The rest of CEE countries that were part of 2004 enlargement cannot be addressed as the dataset does not cover any information from year 2003 or earlier.

There is at least one meaningful control group that can be considered – countries that are not part of the EU and are from similar geographical area such Bulgaria and Romania. These countries are Serbia, Bosnia and Herzegovina, Montenegro, Albania, Macedonia and Moldova. Altogether with Bulgaria, Romania and Croatia they form the research sample.

In Tab. 1, several estimations are made. (1) Regression with only the EU variable, (2) with control variables, (3) with more control variables, (4) and (5) are with different clustering, (6) to (8) use different dependant variables, (9) includes also extreme values, (10) excludes

imputed data for countries that did not have their macroeconomic data, (11) to (12) include lags and (13) include industry trends.

Given the fact that the entrance into the EU gives companies access to the Single Market it is expected that the productivity should rise as companies will have access to more opportunities as well as foreign companies will rise the competition in the two accessing countries. Compared to non-EU companies, the productivity should get higher.

It can be seen that generally, results suggest significant negative relationship between productivity of firms and the fact that their country accessed European Union. This fact can be influenced by number of factors which I try to elaborate on in Conclusion.

When looking on Tab. 1 where new and non-EU countries are compared, one can see that the impact is negative or insignificant. The interesting pattern can be seen after 1 or 2-year lagging. When applying 1-year lag, we can see that the impact is slightly significant or not significant at all. When applying both lags, significance changes from insignificant in year 0 through negative in year -1 to positive in year -2 . From this we can tell that the benefit of accession will hardly be observed at once, but rather over longer period of time or with a lag.

Regarding to robustness of the results, one cannot be sure as most of the models reveal negative coefficient, but some attempts to test

Tab. 1: Estimation of TFP with sample of non-EU countries

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	TFP Added Value	TFP Added Value	TFP Added Value	TFP Added Value	TFP Added Value	TFP Turnover	Rentability Capital	Rentability Labor	TFP Added Value	TFP Added Value	TFP Added Value	TFP Added Value	TFP Added Value
EU	-0.0487*** (0.0106)	-0.0270** (0.0106)	-0.0495*** (0.0103)	-0.0495 (0.0466)	-0.0495*** (0.0155)	-0.0022 (0.0097)	-4.537e+11 (5.282e+11)	-0.5690 (0.3700)	-0.0074 (0.0186)	0.0008 (0.0140)	0.0202* (0.0120)	0.0087 (0.0137)	-0.0682*** (0.0106)
EU lag1												-0.0769*** (0.0149)	
EU lag2												0.1300*** (0.0139)	
Labour		0.1470*** (0.0070)	0.1130*** (0.0068)	0.1130** (0.0392)	0.1130*** (0.0288)	-0.0821*** (0.0259)	1.120e+12*** (2.353e+11)	-0.5360 (0.3270)	0.0962*** (0.0112)	0.0947*** (0.0068)	0.0790*** (0.0079)	0.0827*** (0.0096)	0.1190*** (0.0068)
Capital		0.0724*** (0.0035)	-0.0068** (0.0034)	-0.0068 (0.0243)	-0.0068 (0.0191)	0.0209*** (0.0049)	-5.971e+12*** (7.596e+11)	0.0757 (0.1150)	-0.0506*** (0.0119)	-0.0134*** (0.0035)	-0.0005 (0.0041)	0.00053 (0.0051)	-0.0134*** (0.0034)
GDP		0.1780*** (0.0190)	0.0279 (0.0186)	0.0279 (0.0546)	0.0279 (0.0230)	-0.0553*** (0.0154)	-4.452e+11 (9.462e+11)	-0.9300*** (0.0589)	-0.3970*** (0.0669)	0.1170*** (0.0201)	0.0382* (0.0201)	0.0742*** (0.0212)	0.0300 (0.0187)
Liquidity			0.0612*** (0.0052)	0.0612 (0.0477)	0.0612*** (0.0104)	0.0227*** (0.0060)	-3.522e+12*** (3.517e+11)	0.6730*** (0.0590)	0.0909*** (0.0090)	0.0577*** (0.0053)	0.0732*** (0.0059)	0.0848*** (0.0071)	0.0604*** (0.0052)
Leverage			1.3990*** (0.0212)	1.3990*** (0.0781)	1.3990*** (0.1900)	0.2540*** (0.0268)	-4.919e+13*** (5.523e+12)	3.4250*** (0.7530)	1.7360*** (0.0307)	1.3900*** (0.0213)	1.3900*** (0.0244)	1.3690*** (0.0301)	1.4079*** (0.0213)
Constant	-2.5620*** (0.0057)	-4.6500*** (0.1590)	-3.3030*** (0.1550)	-3.3030*** (0.5510)	-3.3030*** (0.2620)	-1.2750*** (0.1140)	1.799e+13** (7.433e+12)	11.4100*** (0.9520)	0.3490 (0.5270)	-3.9630*** (0.1670)	-3.2520*** (0.1710)	-3.4310*** (0.1850)	-3.5370*** (0.1590)
Observations	839,278	839,280	835,399	835,399	835,399	1,900,902	1,903,746	1,903,462	852,465	790,491	680,532	531,708	835,399
R-squared	0.024	0.029	0.088	0.088	0.088	0.062	0.009	0.045	0.003	0.090	0.095	0.097	0.094
Number of company	199,780	199,780	199,084	199,084	199,084	380,261	377,162	381,393	200,119	192,524	176,500	149,705	199,084
Company FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Year FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Cluster	Company	Company	Company	Country	Industry	Industry	Industry	Industry	Company	Company	Company	Company	Company
Outliers	no	no	no	no	no	no	no	no	yes	no	no	no	no
Sample	New and No EU	New and No EU	New and No EU	New and No EU	New and No EU	New and No EU	New and No EU	New and No EU	New and No EU	New and No EU	New and No EU	New and No EU	New and No EU

Notes: Cluster standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$, EU is the EU accession estimator, Labour is the logarithm of number of employees, Capital is the logarithm of denominated fixed assets, GDP is the logarithm of denominated GDP in Euro, Liquidity and Leverage are logarithms of financial ratios explained in Methods, all with use of denominated values. Other interaction terms and dummies for obtaining the treatment effect are included but not listed. Values used are in thousands of EUR if not stated otherwise. Bulgaria, Romania, Croatia, Bosnia and Herzegovina, Serbia, Albania, Montenegro, Moldova and Macedonia and included.

the robustness showed insignificant relation – e.g. all alternative dependent variables (6–8) or omission of manual changes in the dataset – outliers elimination (9) and macro data imputation (10).

Models are also estimated using multilevel models where companies are nested within countries and therefore it is possible to control for development in particular country (both treatment and control). Results of country level can be seen in the column of particular model, results of company level are in the near left column.

When multilevel models are used, one can see that effect is stronger in magnitude as the coefficients are considerably larger. It might be the case that as the situation of Romania and Bulgaria was not perfect when they accessed the EU (as shown earlier) that the costs compared to non-accessing countries were larger.

Regarding robustness, these models are actually more straightforward than previous ones as only one model (6) is left with insignificant sign – the rest, including alternative dependent variables (7–8) and manual changes (9–10) are significant and negative. Bearing in mind shortcomings of both models and results obtained in Tab. 1, one can observe more evidence in favor of negative impact hypothesis.

5 DISCUSSION AND CONCLUSIONS

The article focuses on the effect of country's accession into the EU and the impact of this action on economic agents – firms. The theory suggests that in ideal sense, the act of accession itself should be regard as productivity enhancing.

Though, the situation of Bulgaria and Romania (and possible other EU countries as well) is different. Results suggest that there is negative or insignificant relationship with productivity of firms in accessing countries. Reasons and possible interpretations of the results might be two-fold.

First, the accession process itself is not black or white and is definitely not one-step process. The accession takes several years (or even almost two decades as in case of these countries) during which the countries are gradually involved in several activities and therefore the benefits could be observable during longer time

period. This conclusion is also accompanied by the lag-implied estimation that show changing significance and direction depending on the year.

Second, in this particular case, the accession did not go as planned for both countries. The planned accession in 2004 was postponed till 2007 and even in that year there were several measures needed to be taken to induce both countries to proceed with requirements of accession (including freezing of funds).

Both of these might be the reasons of the other-than-expected direction of effect of entrance into the EU. This is not to suggest that the EU accession does not have benefits as such, but more to point to the fact that perceived long-term benefits might be balanced or overshadowed by short term costs (in this case in terms of productivity).

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Tab. 2: Multilevel estimation of TFP with sample of non-EU countries

Variables	(1) TFP Added Value	(2) TFP Added Value	(3) TFP Added Value	(6) TFP Turnover	(7) Rentability Capital	(8) Rentability Labor	(9) TFP Added Value	(10) TFP Added Value
EU	-0.2600*** (0.0318)	-0.2260*** (0.0429)	-0.1950*** (0.0100)	-0.0868 (0.0696)	-2.150e+12*** (3.242e+11)	-0.928*** (0.327)	-0.2310*** (0.0574)	-0.2120*** (0.0245)
Labour		0.0613*** (0.0218)	0.0408 (0.0259)	-0.0285 (0.0327)	1.754e+12*** (3.254e+11)	-0.865*** (0.217)	0.0079 (0.0443)	0.0328 (0.0276)
Capital		0.1240*** (0.0173)	0.0542*** (0.0137)	0.1200*** (0.0232)	-3.549e+12*** (3.606e+11)	0.442*** (0.109)	-0.0291 (0.0292)	0.0595*** (0.0144)
GDP		0.1250 (0.1010)	-0.1100 (0.0848)	0.0550* (0.0329)	-2.012e+11 (3.566e+11)	-0.489** (0.243)	-0.5100*** (0.0651)	-0.1340 (0.1070)
Liquidity			0.0341 (0.0439)	-0.0025 (0.0242)	-4.354e+12*** (5.316e+11)	1.265*** (0.291)	0.0293 (0.0824)	0.0262 (0.0429)
Leverage			1.6630*** (0.0173)	0.4840*** (0.0212)	4.504e+13*** (5.910e+12)	4.672*** (0.518)	1.9790*** (0.6360)	1.6630*** (0.0169)
Cons	-2.5630*** (0.0984)	-4.3360*** (0.1360)	-2.4390*** (0.0250)	-2.7230*** (0.3210)	7.014e+12* (3.763e+12)	5.542* (3.013)	1.2420 (1.0620)	-2.2150** (1.0030)
Cons (r.p.)	0.0295 (0.0209)	-330.1000*** (2.5320)	-302.8000*** (2.4380)	0.0378* (0.0219)	-6.9370*** (0.8620)	1.474e+25 (0.000)	5.3290*** (76.7400)	2.5150*** (0.0057)
Cov Cons (r.p.)		0.0827*** (0.0006)	0.0612*** (0.0005)		0.0020*** (0.0002)	2.303e+26 (0.000)	-1.3010*** (0.0191)	0.0000 (0.0000)
Observations	839,278	839,280	835,399	1,900,902	1,903,746	1,903,462	852,465	790,491
Number of groups	5	5	5	7	7	7	5	3
Company FE	yes	yes	yes	yes	yes	yes	yes	yes
Year FE	yes	yes	yes	yes	yes	yes	yes	yes
Cluster	Sandwich	Sandwich	Sandwich	Sandwich	Sandwich	Sandwich	Sandwich	Sandwich
Outliers	no	no	no	no	no	no	yes	no
Sample	New and No EU	New and No EU	New and No EU	New and No EU	New and No EU	New and No EU	New and No EU	New and No EU

Notes: Cluster standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. EU is the EU accession estimator, Labour is the logarithm of number of employees, Capital is the logarithm of denominated fixed assets, GDP is the logarithm of denominated GDP in Euro, Liquidity and Leverage are logarithms of financial ratios explained in Methods, all with use of denominated values. Cons is constant from the fixed part, Cons (r.p.) is constant from random part and Cov Cons (r.p.) is covariation of constant and year variable. Other interaction terms and dummies for obtaining the treatment effect are included but not listed. Values used are in thousands of EUR if not stated otherwise. Bulgaria, Romania, Croatia, Bosnia and Herzegovina, Serbia, Albania, Montenegro, Moldova and Macedonia are included.

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