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Impact of Economic Freedom on Total Factor Productivity in Former Socialist Countries

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ABSTRACT

Total Factor Productivity (TFP) is the portion of the country's output not explained by the amount of inputs used in production. The main goal of the present paper is to estimate the Total Factor Productivity levels and then determine the long-term impact of Economic freedom on the TFP in ten former socialistic countries, which are full EU members since 2000. To estimate the TFP we have applied the fixed effect panel on standard Cobb-Douglas production function in per capita terms. In the second iteration we have used PMG ARDL model to estimate the long-term impact of economic freedom on the TFP. This research has proven that higher level of economic freedom, which is used as a proxy of the quality of the institutions and institutional framework, caused higher level of total factor productivity in the period 2000-2018 in the case of ten former socialistic countries which are full EU members since 2000. The obtained results enable us an insight in policies which are important for efficiency increase and economic performance. Our finding could be very useful for policymakers, stressing which policies are contributing to efficiency, and which are not. So that policymakers could intervene in the way to increase the quality of institutional framework and economic institutions. Many other studies investigate the TFP and growth, or growth and institutional framework for the countries of Central and East Europe. Our survey is among the first to investigate the long-term impact of the institutional framework and economic institutions on the countries efficiency for this countries. Our survey enables us an insight into the mechanism through which the institutions can positively impact the TFP through increasing the predictability and reducing the uncertainty for CE countries.

Key words: *growth, total factor productivity, economic freedom, institutional framework, Cobb-Douglas production function*

JEL Classification: O30, O38, F20

INTRODUCTION

Intense and ruthless competition is the main characteristic of modern capitalism. The technological development, which leads to increased efficiency, represents the concrete foundation of sustainable growth in the environment which is characterized by fierce competition. The neo-classical model of economic growth specifies that technological progress is exogenous. On the other hand, the endogenous growth theory suggests that technological development is created within the economic system, and it is affected by economic decisions. The quality of institutions and institutional framework, and their impact on efficiency has been in the focus of recent growth literature. One of the main questions in economic literature regards

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the differences in life quality between rich and poor countries. Many authors, like Hall and Jones (1999) and Acemoglu, Johnson and Robinson (2008), claims that these differences in wellbeing can be explained by differences in quality of institutions and institutional framework. This study relies on the so-called today "New Institutional Economics and Development Literature". The incentives of the key economic actors are shaped and influenced by economic institutions. The production organization, investment in human and physical capital, decisions between investments and savings, technological progress, are all shaped by economic institutions.

In our survey, we use the economic freedom as a proxy of the quality of the institutions and institutional framework. There are two economic freedom indexes which have been used in economic literature to measure the quality of institutions and institutional framework. The Economic Freedom Index (EFI) represents the first attempt to quantify the quality level of institutions and institutional framework., and it is reported annually by the Fraiser institute in the report called Economic Freedom of the World. The Fraiser institute started the Freedom of the World project with Milton Rose and Friedman in 1986. The Index of Economic Freedom (here and after IEF) is published by the Heritage Foundation in cooperation with the Wall Street Journal. As Berggren states, ``Economic freedom is a composite that attempts to characterize the degree to which an economy is a market economy—that is, the degree to which it entails the possibility of entering into voluntary contracts within the framework of a stable and predictable rule of law that upholds contracts and protects private property, with a limited degree of interventionism in the form of government ownership, regulations, and taxes`` (Berggren, 2003. p 194). Total Factor Productivity (here and after TFP) is the portion of output not explained by the amount of inputs used in production (Comin, 2008). Regarding the TFP, our position is close to the "conventional view", in according which, changes in TFP measure the rate of technical change (Law, Krugman, Young). In our paper, we use the TFP as the best expression of the efficiency of economic production. Many studies conducted by Solow (1957), Hall and Jones (1999), and more recently, Caselli (2005) and Jorgenson and Vu (2010), have proven the hypothesis that the TFP represents an important channel, through which economic freedom impacts the GDP per employee.

In this survey we investigate TFP determinants by focusing on economic freedom. We conduct our analysis on ten former socialist countries which are a full European Union members since 2004 (Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic and Slovenia). They were all a part of socialist economic system with central planning. These countries have changed their economic system and shifted from socialism to capitalism. Our survey cover the time period between 2000 and 2018.

This study is organized as follows. After this introduction, in the second section, we present a critical review of the existing literature regarding economic freedom and TFP. In the third section, we provide the model specification and used methodology. Empirical results and discussion are presented in the fourth section, while the fifth section concludes the paper.

LITERATURE REVIEW

There are numerous studies which focus on the impact of economic freedom on the economic growth (Ayal and Karras, 1998; Gwartney et al., 1999; Heckelman, 2000; De Haan and Sturm, 2000; Dawson, 1998). In all these studies, the researchers came to the same conclusion, that economic freedom does have a positive and statistically significant impact on the economic growth. Economic freedom is guaranteed by an institutional structure. This means that liberal market economy creates an environment that is both augmenting growth and accelerating development (Ulosoy and Tas, 2017). Even though there is a consensus regarding positive impact of economic freedom on the economic growth, many researchers have find that sub-components of both economic freedom indexes can have positive or negative impact on economic growth.

Acemoglu (Acemoglu et al., 2004) states that quality institutions are of great importance for the productivity and economic growth. According to Henry (Henry, 2003) economic freedom have a positive impact on the physical capital. The mechanism is very simple, the higher the economic freedom is, the more will economic actors save and invest, thus, increasing the physical capital.

High level of economic freedom means free international trade. According to Cagetti and DeNardi (2006), removing the restrictions on capital movements between countries will increases the supply of venture capital, which may lead huge increase in innovation. Impact of the FDI on the TFP, both in the host and in the home country has been investigated by a number of authors. There are two channels through which the FDI inflow can positively affect the TFP in the host country (Griffith, et al. 2003). On one hand, the FDI inflow can lead to the increase in the competition, which might result in speeding up domestic innovative outcomes. On the other hand, as the result of the FDI inflow, the host country is expected to benefit from the technology transfer (Keller, 2004). These positive effects of the FDI inflow are much more important for less developed economies, because of their larger distance to the international technological frontier. According to Aitken and Harrison (Aitken and Harrison, 1999), the developing countries might be unable to utilize the benefits of FDI inflow due to their weak absorptive capacity. Analogously, if the knowledge-base synergies are strong enough to flow from the host to the source country, the home country will benefit from productivity increase.

The positive effect on TFP growth rate can be achieved through the openness in international trade (Alcalá and Ciccone 2004; Coe and Helpman 1995; Greenaway and Kneller 2007; Wagner 2007). Trade flows of goods and services, similarly as in the case of FDI, might lead to an increased competition of domestic sectors.

Bjørnskov and Foss (2010) have stressed that high level of regulation, sound money, judicial system, security of property rights, openness to international trade and investments, all have a positive impact on TFP. On the other hand, high taxes and large government can have both, positive and negative impact on the TFP. The institutions with high level of economic freedom can positively impact the TFP through reduction of transaction costs, increasing the predictability and reducing the uncertainty. This positive impact is direct result of the favorable environment for the entrepreneurial experimentation that lead to productivity-enhancing innovations in products, processes and ways of organizing productive activities (Bjørnskov and Foss, 2010).

MODEL SPECIFICATION AND METHODOLOGY

Our analysis is split in two iterations. In the first iteration, we will estimate the TFP levels over time and across countries. In the second iteration, we will investigate the impact of economic freedom on the TFP. To estimate the TFP, we will apply the Cobb-Douglas production function. Our analysis is based on the assumption that all analyzed countries are very homogenous in relation to structural and institutional factors affecting productivity. The standard Cobb-Douglas production function can be written as:

$$Y = AK^{\alpha}L^{1-\alpha} \tag{1}$$

, where Y represents output or real GDP, the K stands for the economy-wide capital stock, L represents employment and α is the elasticity of output to capital. The A is interpreted as the TFP. With some rearrangement, the standard Cobb-Douglas production function is transformed into a log-log model:

$$\Delta \log Y = \Delta \log A + \alpha \Delta \log K + (1-\alpha)\Delta \log L \tag{2}$$

The modern economic literature is rich with empirical approaches for TFP evaluation (see. Welfe (ed.) 2007; Severgnini and Burda, 2010, pp. 447–466; Gehringer et al., 2014). The TFP estimation is also split into two iterations. Our analysis is based on the approach proposed by Tokarski (Tokarski, 2008) and later, used by Balcerzak and Pietrzak (Balcerzak and Pietrzak 2015a; 2015b, 2016). Firstly, the Cobb-Douglas production function is estimated in per capita terms:

$$\log y = c + gt + \alpha log k \qquad (3)$$

, where y is GDP per employee, k stands for capital per employee, g is the rate of technological progress in the sense of Hicks, α is the elasticity of labor productivity to the capital to labor ratio, and it is time trend. The classification of technical progress was presented by Sir John Hicks in his Theory of Wages (1932). The technical progress, in per employee production function, is said to be Hicks-neutral if, at any constant value of the capital-labour ratio (K/L), the ratio of the marginal product of capital to the marginal product of labour remains constant. Hicks-neutral progres implies that the ratio of rental rate of capital to the wage rate is constant. And thus, the ratio of relative shares of labour and capital income in national income is constant. In other words, the Hicks-neutral technical progress indicates the economy's growth rate, assuming that capital investments and the employment are kept constant.

The fixed parameter α has been applied in the TFP calculation for all countries, with different output per employee, and with different capital per employee. After estimation of parameter α from equation (3), we can estimate the TFP in the second iteration, by applying parameter α in the following equation (Tokarski, 2008, pp. 38–53):

$$TFP = \frac{y}{k^{\alpha}} \qquad (4)$$

With some rearrangements, we can rewrite equation (4) in log terms (Balcerzak and Pietrzak, 2016):

$$\log TFP = \log y - \alpha \log k \qquad (5)$$

The data on the capital volume is very often published by the official statistics offices. The problem is that the data on the capital volume published by official statistical offices from different countries are very likely obtained by applying different methods. Therefore, the additional calculation is necessary in order to obtain the TFP. The researchers have used the perpetual inventory method in many studies for assessment of the capital stock. The perpetual inventory method can be described with the following equation:

$$K_t = I_t + (1 - \delta)K_{t-1} \qquad (6)$$

Where δ represents the depreciation rate and I stands for investments. The subscript t stands for the beginning of the time period t and t-1 represent the previous time period. The assessment of capital stock requires the calculation of the anchor capital volume. In many studies, the researchers have used the first year in the sample as an anchor year. In the steady-state, the anchor capital volume is characterized by constant growth rate g. Assuming the steady-state of the economy, we can calculate the anchor capital volume with the following equation:

$$K_0 = \frac{I_0}{g+\delta} \qquad (7)$$

Where K_0 is the initial capital stock, I_0 are investments in the anchor period. The steady-state assumes that output and capital grew at the same rate (Harberger, 1988). Therefore, we can use

the growth rate of output smoothed using an HP filter with λ = 100, to evaluate the steady-state growth rate. The last piece of a puzzle needed for evaluation of the capital stock in the initial period, and for estimation capital volume from time to time, is the depreciation rate. In our survey, we will set the depreciation rate at 0.05, with the assumption that the depreciation rate is constant over the period and across countries. Many authors and researchers set the depreciation rate between 0.04 and 0.1 (Vanags and Bems 2005; Griliches, 1980; Nehru and Dhareshwar, 1993; Romer, 1988; Kamps, 2006; Rapacki and Prochniak, 2009; Berlemann and Wesselhöft, 2014; Harberger, 1988; Nadiri and Prucha, 1996). There are many surveys where the depreciation rate is set at 0.05 (De la Fuente and Doménech, 2006; Hernandez and Mauleon, 2003; Cororaton, 2002; and Felipe, 1997).

Once we estimate the TFP levels over time and across countries, we will investigate the existence of co-integration relationship between TFP and economic freedom. Here, we will estimate the models which is described with following equatuion:

$$\log tfp = c + \log efi + \log M + \varepsilon \qquad (8)$$

, where EFI represents the composite index of economic freedom, and vector M holds the control variables: openness, FDI and human capital, and ε represents the error term. A similar vector of control variables was used by Borovic, Rebic & Tomas (2020) in order to capture the TFP drivers for the fourteen EU countries.

DATA AND RESULTS

We will conduct our analysis on ten former socialist countries which are a full European Union members since 2004. for the period 2000-2018 (Bulgaria-BUL, Czech Republic-CZE, Estonia-EST, Hungary-HUN, Latvia-LAT, Lithuania-LIT, Poland-POL, Romania-ROM, Slovak Republic-SLV and Slovenia-SLO). Variables, their definition and sources are presented in Table (1).

Table 1. Variables description

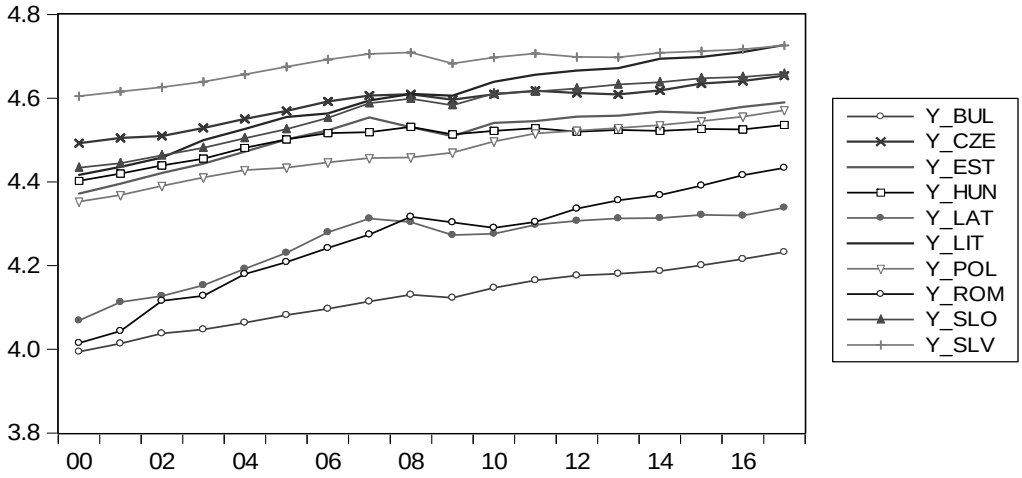
Variable	Description	Source
Y	GDP (constant 2010 US$)	World Bank national accounts data, and OECD National Accounts data files.
I	Gross fixed capital formation (constant 2010 US$)	World Bank national accounts data, and OECD National Accounts data files.
K	Capital stock	Authors calculation
L	Number of persons engaged (in millions)	Penn World Table
y	GDP per employee	Authors calculation
k	Capital per employee	Authors calculation
TFP	Total Factor Productivity	Authors calculation
EFI	Index of Economic Freedom	Heritage foundation
OPEN	Calculated as a sum of export and import as a percentage of GDP	World Bank national accounts data, and OECD National Accounts data files.
FDI	Foreign direct investment, net inflows (% of GDP)	World Bank national accounts data, and OECD National Accounts data files.
h	human capital investment rate -as proxied by secondary enrolment rate	World Bank national accounts data, and OECD National Accounts data files.

Source: Authors

Some observation for the FDI were negative, se we had to transform them using the following procedure (Busse and Hefeker, 2007; Ren, et al, 2012).

$$Y = \log\left(x + \sqrt{x^2 + 1}\right) \quad (9)$$

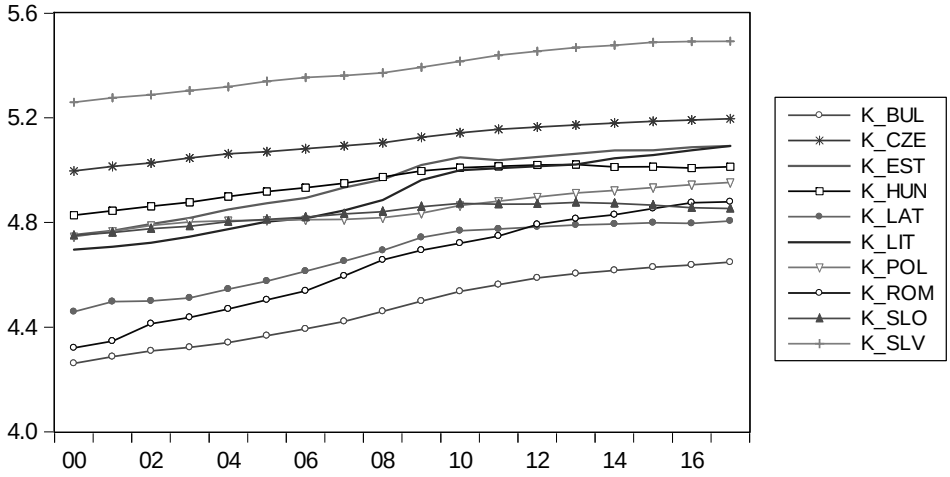
The data on GDP per employee are presented on graph (1).



Graph 1. GDP per employee (in logs)

Source: Authors

Most of the countries converge around the same level of average productivity over the time period, and with similar growth rates of average productivity. Three countries have an average productivity below the general level, but with tendency to catch up with the rest of the sample. The data on capital per worker are presented on graph (2).



Graph 2. Capital per worker (in logs)

Source: Authors

Most of the countries converge between 4.4 and 5.0. The countries below the average level tend to catch up, because of higher growth rates of the capital per worker, relative to the countries above average.

We start econometrics estimation by estimating Cobb-Douglas production function in per capita terms (equation (3). The authors which have used the equation (3) to estimate the parameter α, they did not test the series for stationarity, instead, they used a panel with fixed

effects, i.e. classic OLS (Tokarski, 2008, Balcerzak and Pietrzak 2016a, 2016b). The estimation of parameter α was carried out by applying the classic OLS on panel data with fixed effects. In addition to the classic OLS estimation, we have checked for robustness. The estimation of parameters for equation (3) is presented in table (2). The parameters α and g are statistically significant at 5% level of significance. The results of estimation are presented in Table (2).

Table 2. Estimation of elasticity of labor productivity to the capital to labor ratio (α)

Parameter	Estimate	Robust std. err.	P value
α	0.392412	0.000	0.000
g	0.011323	0.011	0.011
constant	1.959962	0.006	0.006
R-sq	0.44		

Source: Authors calculation

The technological progress in the sense of Hicks (parameter *g*) is estimated at 0.011323, which means, that under assumption of constant level of capital and labor, the selected countries are characterized with rate 1.1323% of production growth.

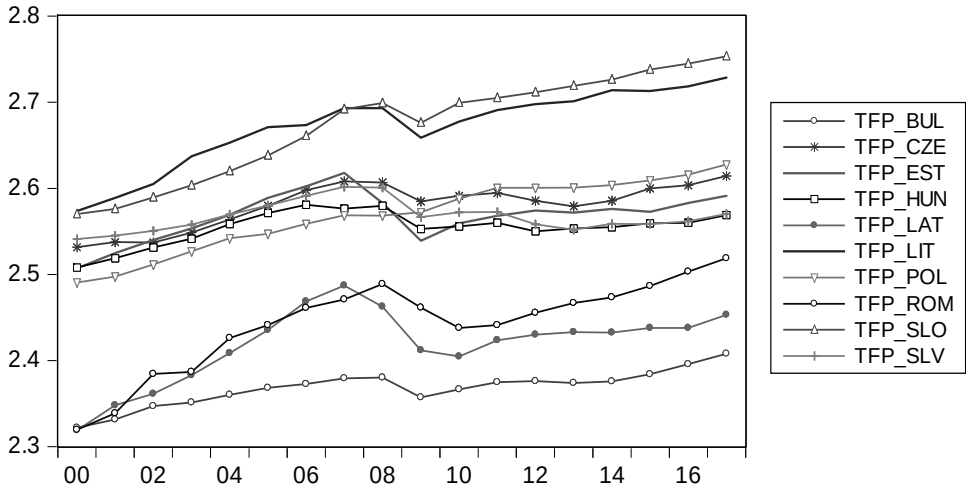
Once we have estimated the parameter α, we will calculate the TFP by applying the α on equation (5). The descriptive statistics for TFP, EFI, h, FDI, and openness are presented in table (3).

Table 3. Descriptive statistics for TFP, EFI, h, FDI, and OPENNESS

	TFP	EFI	FDI	H	OPEN
Mean	2.54	65.98	11.47	98.99	119.36
Median	2.56	66.10	7.80	98.17	122.96
Maximum	2.75	79.10	109.75	117.52	190.68
Minimum	2.32	47.30	0.032	79.78	48.52
Std. Dev.	0.10	6.13	14.66	7.65	33.68
Observations	178	178	178	178	178

Source: Authors calculation

The TFP on a country level is presented in graph (3).



Graph 2: Evolution of the TFP on country level (in logs)

Source: Authors calculation

Regarding the TFP, we have three groups of countries. The first group of countries converges around the same level of the TFP (2.5): Poland, Czech Republic, Estonia, Hungary, and Slovakia. Also, they have almost the same growth rate of the TFP. The second group of countries is characterized by the lowest tfp rate: Bulgaria, Latvia, and Romania. Since 2010. their growth rates of the TFP accelerates and tend to catch up with the first group. The third group has the highest TFP level, and the growth rates of the TFP are much higher than the rest of the sample. Members of this group are Slovenia and Lithuania.

Our data are not affected by the problem of multicollinearity. The correlation matrix is presented in table (4).

Table 4. Correlation matrix

	TFP	EFI	FDI	h	OPEN
TFP	1				
EFI	0.4682	1			
FDI	-0.1236	-0.0160	1		
h	0.2796	0.5365	-0.1975	1	
OPEN	0.5767	0.5960	-0.0829	0.3796	1

Source: Authors calculation

In the present paper, we have used a Cross-section dependence test (Pesaran CD test) to test the null hypothesis that there is no cross-section dependence (correlation) in the time-series, CD $\sim$ N(0,1). Ignoring a cross-section dependency in panel analysis will result in substantial bias in estimations. The results of a Cross-section dependence test are presented in table (5).

Table 5. Cross-section dependance test

Variable	CD test	P value
TFP	22.717	0.000
FDI	10.308	0.000
EFI	12.999	0.000
h	14.663	0.000
OPP	25.764	0.000

Source: Authors calculation

The results of Cross-section dependence test showed that change in TFP, FDI, h, and OPP that occurred in any of the observed countries affected other countries as well.

We have used the second generation of unit root test (CIPS cross-section Im, Pesaran, and Shin) in order to test our series for stationarity. The results are presented in table (6).

Table 6. Unit root test

Series	Stationarity
TFP	*I (1)*
EFI	*I (1)*
h	*I (0)*
OPEN	*I (0)*
FDI	*I (0)*

Source: Authors calculation

Our main goal is to determine the long-term impact of Economic freedom on the TFP. We have used human capital, FDI, and country openness to capture their impact on the TFP. Our series do

not have the same level of integration, in which case standard co-integration tests such as Pedroni, Kao and Fisher Johansen test are not allowed. Instead, we will use relatively new PMG ARDL (Autoregressive Distributed Lag) model proposed by Pesaran (1997) and Pesaran and Shin (1999) which will enable us an effective estimation of both long and short-term effects, on the basis of panel data series with a different level of integration, but lower than I(2). We have fixed the number of lags of both dependent and independent variables to 1. The form of the dynamic ARDL (p, q) model was defined by Paseran and Shin (1997):

$$y_{it} = \sum_{j=1}^{p} \lambda_{ij} y_{i,t-j} + \sum_{j=0}^{q} \delta_{ij} x_{i,t-j} + \mu_i + \varepsilon_{ij} \qquad 10$$

, where i represents the number of observation units i =1,2,....,N; t represents the number of time instances t =1,2,....,T; x_{it} is vector of independent variables of dimension k ×1; λ_{ij} is coefficient of lagged dependent variable; μ_i is parameter that determines the specific effects of the group or observation unit. A similar cointegration technique was carried out by Gligoric, Borovic & Vujanic (2017) for the Commonwealth Of the Independent States, which are also former socialist countries. We have estimated five different models, and the best model is chosen based on log-likelihood, Akaike, and Bayesian information criterion. The results of our analisys for the PMG estimator are presented in table (7).

Table 7. Results of the PMG ARDL estimation

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
Short-run coeff.					
ECT	-0.174***	-0.142*	-0.104***	-0.153***	-0.125***
	(0.056)	(0.085)	(0.029)	(0.051)	(0.043)
Δ EFI	0.016	-0.054*	0.125***	0.023	0.015
	(0.035)	(0.030)	(0.045)	(0.029)	(0.026)
Δ FDI	-0.001	0.004		0.001	0.002
	(0.001)	(0.003)		(0.001)	(0.002)
Δ h	0.009		0.019	0.029	
	(0.069)		(0.051)	(0.088)	
Δ OPP	0.044**	0.045**	0.063***		
	(0.017)	(0.020)	(0.015)		
Long-run coeff.					
EFI	0.244***	0.627***	-0.765***	0.307***	0.392***
	(0.060)	(0.079)	(0.255)	(0.079)	(0.075)
FDI	0.054***	0.006		0.060***	0.063***
	(0.007)	(0.004)		(0.008)	(0.008)
H	-0.027		0.449**	0.087	
	(0.093)		(0.186)	(0.074)	
OPP	0.091***	0.074***	0.018		
	(0.031)	(0.015)	(0.047)		
Constant	0.196***	-0.058*	0.374***	0.114***	0.102***
	(0.059)	(0.035)	(0.106)	(0.033)	(0.029)
Obs.	168	170	168	168	170
Log Lik	601.5	584.3	584.2	567.8	566.7
AIC	-1183	-1153	-1152	-1120	-1121
BIC	-1152	-1127	-1127	-1095	-1103
Standard errors in parentheses					
*** p<0.01, ** p<0.05, * p<0.1					

Source: Authors calculation

According to log-likelihood, Akaike, and Bayesian information criterion, the best PMG ARDl estimator is Model 1, therefore, our conclusion will be based on the PMG estimation of model 1. The existence of a long-run relationship among the variables of interest requires that the coefficient on the error–correction term (ECT) has to be negative and not lower than -2. In our model, error correction term is statistically significant at 1% level and negative, which means that variables in our model have long rung equilibrium. Except human capital, all variables are statistically significant at 1% level. Our variable of particulas interest, Economic freedom index (EFI) is statistically significant a 1% level and positive, which is expected. We can conclude that high economic freedom led to the higher total factor productivity in the selected former socialistic countries. Other two variables which have statistically significant impact on total factor productivity also have expected positive impact on total factor productivity. Higher openness to foreign trade and foreign direct investment growth cause higher total factor productivity growth.

In assessing the effects of economic freedom on total factor productivity growth, one important concern is the possibility of reverse causality, namely that countries with higher total factor productivity have higher degree of economic freedom. We test directly for reverse causality by conducting Pairwise Dumitrescu-Hurlin test.

Table 8. Dumitrescu-Hurlin causality test

Null hypothesis	Zbar-stat	P value
EFI does not homogeneously cause TFP	0.0912	0.0365
TFP does not homogeneously cause EFI	1.2919	0.3160

Source: Authors calculation

The results of Dumitrescu-Hurlin test indicate that we can accept hypothesis that total factor productivity does not granger-cause economic freedom, i.e. we have no problem with reverse causality. Also, we cannot accept the hypothesis that economic freedom does not Granger Cause total factor productivity.

CONCLUSION

This research has proven that higher level of economic freedom, which is used as a proxy of the quality of the institutions and institutional framework, caused higher level of total factor productivity in the period 2000-2018 in the case of ten former socialistic countries which are full EU members since 2000. The presence of cointegration between the total factor productivity and composite index of Economic freedom are observed using PMG ARDL model while Dumitrescu-Hurlin test has indicated that reverse causality between this two variables does not exist. Also, foreign direct investment and openness rate have positive and significant impact on economic growth in observed countries.

Half of our sample converge around the same level of TFP (2.5), and their growth rate of TFP tends to decelerate after the crisis. Two countries with the highest level and highest growth rate of the TFP are Slovenia and Lithuania. The lowest TFP is a characteristic of Bulgaria, Latvia, and Romania. But, since 2010. Their growth rates of the TFP are accelerating and they tend to catch up with the rest of the sample.

The results of our research are in line with those of Ulosoy and Tas, Acemoglu, Henry, and Bjørnskov and Foss. The conclusion is same, the economic actors will invest more and produce more in environment which characterize higher level of economic freedom.

Quality institutions and institutional framework are of great importance for the productivity and economic growth in former socialistic countries. The obtained results enable us an insight in policies which are important for efficiency increase and economic performance. Our finding could be very useful for policymakers, stressing which policies are contributing to efficiency, and

which are not. To boost productivity and economic growth, policymakers should intervene to increase the quality of institutional framework and economic institutions.

Many other studies investigate the TFP and growth, or growth and institutional framework for the countries of Central and East Europe. Our survey is among the first to investigate the long term impact of the institutional framework and economic institutions on the countries efficiency for this countries. Our survey enables us an insight into the mechanism through which the institutions can positively impact the TFP through increasing the predictability and reducing the uncertainty for CE countries.

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APPENDIX

Table 5. Unit root tets results

Variable	Exogenous variables	Second generation of unit root test	Cips test Statistics	Number of opservations
TFP	individual-specific intercepts; incidental linear trends	CIPS cross-section Im, Pesaran, and Shin	-2.326	170
EFI	individual-specific intercepts; incidental linear trends	CIPS cross-section Im, Pesaran, and Shin	-2.064	170
h	individual-specific intercepts; incidental linear trends	CIPS cross-section Im, Pesaran, and Shin	-1.576**	158
FDI	individual-specific intercepts; incidental linear trends	CIPS cross-section Im, Pesaran, and Shin	-3.597***	170
OPENenes	no constant nor trend	CIPS cross-section Im, Pesaran, and Shin	-1.862**	170

*** p<0.01, ** p<0.05, * p<0.1

Source: Authors calculation

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