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Convergence and economic integration of CEECs through EU regional policy system

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ABSTRACT

In order to assess the effectiveness of individual management systems in the analysed EU countries (Croatia, Poland, Slovakia, Latvia, Lithuania, Estonia, Malta, Cyprus, Slovenia, Hungary), an econometric analysis of the interdependence between the quality of the institutional and regulatory framework and the absorption of EU funds and economic growth was conducted. Conceptually, the econometric analysis aims to identify two levels of interdependence between institutional and regulatory variables on the one hand and dependent variables on the other: (1) the effect of the quality of the institutional and regulatory environment on the absorption of EU funds; (2) the effect of the quality of the institutional and regulatory environment on economic growth. The results of the analysis confirm that EU funds have led to increased economic growth in EU countries which provides basis for economic convergence. However, the allocation of funds alone did not necessarily increase the quality of the institutional framework and competitiveness of the analysed countries. Thus, the paper confirms the importance of improvement of the institutional and regulatory framework of particular grant recipient country, as this not only increases the absorption of EU funds, but also improves the economic growth prospects.

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1. Introduction

The purpose of this paper is to provide answers to two research questions. First, does the institutional and regulatory quality of each country matter for the level of absorption of EU funds? Second, and more importantly, does institutional and regulatory quality increase economic growth and thus the prospects for economic convergence of the new EU member states with the EU average? These two questions are, of course, interrelated in the sense that financial support to the new Member States has an impact on the development of the recipient countries, both by raising the level of

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infrastructure, technological and organisational levels, and institutional and regulatory mechanisms. Therefore, it should be the case that increasing institutional quality affects both the absorption rate of EU funds and economic growth. In this sense, economic growth is stimulated both indirectly by institutional reforms and directly by financial support.

The existence of a regional development disparities has made it necessary for the EU to invest in less developed areas, i.e., design various programmes to support growth in these areas. Because of the heterogeneity in European local institutional endowment, and the increasing focus of EU policies on the regional level, the regional scope is particularly relevant (Agostino et al., 2020). From the theoretical perspective, as Korzhenevych and Bröcker (2020) noted, investment subsidies (especially EU structural funds) are mainly seen as an instrument of an efficient policy for strengthening regional economic activity, improving regional economic structure, increasing spillover effects, and boosting economic growth. Considering the current trends in regional economic sciences, it is of note that current research is largely focused on the analysis of EU regional policy, short- and long-term issues relating to EU regional policy, and its financial framework (more in Bachtler et al., 2019; Crescenzi et al., 2020).

In this paper we refer to outcomes of EU regional policies which operate through EU regional system as a mechanism which includes allocation of EU funds through specific national implementation schemes. Thus, for us, EU regional policy system is a hybrid of EU allocation mechanism and particular member country institutional framework. McMaster and Bachtler (2005) provided a comparative analysis of how the member states that joined the EU in 2004 accomplished three essential functions: (1) programming and structural assistance, (2) institutional training, and (3) the implementation of the funds. Given that each EU Member State independently establishes an EU fund management system, i.e., an institutional system for managing EU regional policy funds, the analyses of these systems are mainly done by individual countries and they are limited to a description of the system, without elaborating on its efficiency and improvement guidelines. There is no legal basis for requiring Member States to harmonize their regional policies. EU regional policy is there to complement and support individual Member States' regional policies. Thus, there is a need to establish an effective system of managing EU regional policy funds in each EU country, and in doing so achieve both integration and convergence. To do that, it is necessary to integrate the analytical and professional knowledge on the efficiency of the EU regional policy fund management system and the theoretical concepts of regional development, and put them in the context of the need to adapt national management systems so that they correspond to real development needs, investment priorities and administrative capacity.

It is worth to note that studies which specifically deal with relation of institutional quality on EU fund absorption are relatively scarce. We find several studies that research link between institutional (often administrative) capacities and regional policy fund management systems has been analysed to a smaller extent (Boijmans, 2014; Farole et al., 2011). Constantin et al. (2011), as well as Ferry and McMaster (2013) deal with effect of institutional system created in each member state on EU fund

absorption rate, but do not specifically deal with the institutional and regulatory details. Borys et al. (2008) find important indirect effects of institutions on economic convergence based on the sample of EU candidate countries. Buterin et al. (2017) find significant positive impact of institutional reforms on the economic growth of transition countries. This study advances these results in sense that it provides much more details on the relevance of particular institutional determinants on the absorption performance and economic growth.

The second research question focuses on the question of weather institutional quality brings economic convergence. Place-based policies are one way for governments and institutions to respond to economic and social challenges, bringing together a package of measures that seek to meet regional needs in their totality (Beer et al., 2020). Planning for regional development for the 'macro' approach, or overall regional development at the EU level, as noted by Jensen et al. (1979, re-published in 2018), requires structural and other particular development details on individual regional economies and the capability to assess the regional impact of a given economic change on the component industries of each region. As Kourtit and Gordon (2019) emphasise, a new major dilemma in regional growth strategies concerns whether policies should focus on the region as a promising geographic anchor point or on the selection of a critical economic base or core industry/industries as a basis for accelerated regional economic development. According to Capello and Nijkamp (2019), the development process depends on the efficiency of the territorial organisation of production (but also the learning processes, local relational networks and governance mechanisms), rather than solely on the quantity of economic resources available. Giannakis and Bruggeman (2020) explored the temporal and spatial patterns of economic resilience across European urban, intermediate and rural regions and the significance of territorial and structural factors during the recent economic downturn and found that there are statistically significant differences in economic resilience across the EU. The results indicate that migration is the factor with the greatest positive effect in regional resilience so policy interventions are necessary to improve employment opportunities in lagging-behind regions. There are many studies dealing with economic convergence of post-transition countries in terms of monetary aspects (Deskar-Škrbić et al., 2020; Kjosevski et al., 2020), impact of public debt (Fetai et al., 2020) and other factors such as education level, investment, government spending etc. (Radosavljević et al., 2020), but studies on the outcomes of the EU regional policy and regional policy system are rare.

Evidently, there are considerable disparities among European regions according to both economic and non-economic indicators, so the EU is facing great challenges in the implementation of structural policies. A question arises: Is the EU an 'engine' of growth and a pathway towards convergence for Member States, especially CEECs (Central and Eastern European countries), and what are the main positive effects of economic integration processes in the EU? Regional economic integration processes have a major positive impact on (1) trade creation and trade diversion, (2) structural transformation of exporting from predominantly price competitive pattern towards more technology intensive one, (3) structural diversification and changes in both local and regional production structure, (4) diversification vs. specialisation in terms of

local and regional production lines, (5) creating an effective entrepreneurship ecosystem and collaborative innovation, (6) "tidying up" institutions, and (7) increasing productivity on the micro, regional and macro level. As Tomaney et al. (2017) explains, place-based policies have the potential to generate benefits for affected regions that span several policy domains and include diverse determinants of individual and collective welfare.

The empirical study in this paper uses sample of ten EU member countries (from 2004) in the period from 2007 to 2019. We use World Economic Forum's Global Competitiveness Index (GCI) and indicators from Doing Business report, as well as Eurostat data to test importance of the institutional and regulatory variables on the EU absorption level, as well as economic growth. The main results show important benefits from rising institutional quality. More specifically we show that burden of government regulation, favouritism in decisions by government officials, transparency of government policy making, public sector performance, and government efficiency are crucial for the effective allocation of EU funds and good dynamics of their absorption. Also, improved protection of property rights, reduced wasteful government spending, and improvements in ethics and anti-corruption practises, public sector performance and government procurement of advanced technology products show direct positive effects on economic growth. Thus, this study provides clear policy guidelines for recipients of the EU funds.

The paper is structured in six chapters. After introduction, second chapter reflects on theoretical and empirical contributions on the relevance of institutions on EU fund absorption and economic convergence. Third chapter deals with empirical methodology. Results and interpretation of the empirical exercise are presented in chapter four. Conclusion deals with key argumentation on the research questions, policy recommendations as well as limitations and future studies.

2. Institutional and regulatory framework, EU structural funds and economic convergence

As it was mentioned within the introduction, there are only several studies which research aspects of institutional and regulatory framework of European countries which receives grants from the EU structural funds. There are few studies that research link between administrative capacities and regional policy fund management systems (Boijmans, 2014; Farole et al., 2011; Incaltarau et al., 2020; Țigănașu et al., 2018) and also few studies that deal with effect of specific institutional system on EU fund absorption rate (Constantin et al., 2011), Ferry and McMaster (2013). However, these studies do not specifically deal with the institutional and regulatory details. Absorptive capacity, as noted by Constantin et al. (2011), can be addressed from the perspective of the institutional system created in each member state to manage the funds, as well as from the perspective of the beneficiaries of these funds. This finding is supported by the study of Ferry and McMaster (2013), which showed that in Slovakia, for example, a full 58.9% of development spending in 2000–2006 came from EU structural funds and Cohesion Funds, compared to 50.3% in Poland and 13.5% in Czech Republic. Such financial allocations and "pressure on institutional

arrangements" were particularly significant for the transition countries in Central and South-Eastern Europe.

On the other hand, there is a voluminous research on the effects of economic integration on economic convergence where only some of the studies research effects of improvements of the institutional quality (such as Buterin et al., 2017). There are numerous researchers that show overall development benefits from reducing economic disparities between EU member countries. In other words, it is possible to maximise overall macroeconomic growth in EU in parallel with the process of convergence between EU regions (Crescenzi & Giua, 2020; Varga & In 't Veld, 2010). Yin et al. (2003) point out that EU countries could converge faster if they could reduce economic and socio-political disparities. In this sense, CEECs could be considered as countries implementing market reforms and forming the so-called "convergence club" (Dunford & Smith, 2000; Friedrich-Eckey & Türck, 2007; Harris, 2008; Jakubowski, 2018; Monojit, 1992; Sachs & Warner, 1995). Nonetheless, there are approaches that argue that convergence models are of limited value because they link a region's growth only to its own history and not to the interregional system of which it is a part. Moreover, Strielkowski and Höschle (2013) point out the problematic nature of research on convergence between CEECs, given the limited values, the conditions in the countries before their accession to the EU, the transition dynamics after EU accession, the financial and economic crisis of 2008, and a number of other circumstances that sometimes make it difficult to demonstrate strong convergence. However, if one looks at other economic indicators (or specific indicators such as the volume of industrial production, exports per capita, etc.), convergence is evident.

Of course, if one of the observed less developed countries or regions has a lower savings rate or does not have adequate public policies, convergence will not be at the same level (see also: Sachs & Warner, 1995). Friedrich-Eckey and Türck (2007) point out that convergence studies provide arguments for EU structural funds and divergent regional development in the long run, or the large dispersion of convergence rates justifies Structural Fund spending. Jakubowski (2018) and Zbigniew and Mariusz (2004) reach a similar conclusion when examining the (positive) effects of EU accession and convergence between member states. Many studies have found evidence of a significant positive impact of the duration of membership in the EU on economic growth, especially for countries that lagged significantly before accession, and economic prosperity after accession (Crescenzi & Giua, 2020; Ferry & McMaster, 2013; Jakubowski, 2018; Strielkowski & Höschle, 2013; Zbigniew & Mariusz, 2004). In their study, Martin et al. (2001) reached the following important conclusions:

1. the main effect of European economic integration has been to enable diffusion of technologies as embodied by converging capital/labour relations, which in turn has fostered real convergence,
2. real convergence is not a foregone conclusion, but depends on a number of other factors, primarily human capital,
3. other common European policies (Single Market, economic and Monetary Union) may be as important as trade in maintaining convergence in the long run,

4. foreign direct investment is one of the most important channels for diffusing positive technological effects to overcome “technological backwardness"; macroeconomic stability and the quality of human capital are key to reaping the benefits of these channels; and
5. in addition to high transfers from the EU, other factors are necessary, such as macroeconomic stability, an efficient institutional framework, competition and labour mobility, confirming that EU integration can be extremely beneficial for convergence, but it is not a substitute for individual national policies, which must be as efficient as possible.

Also, Ascani et al. (2012) found links between economic integration, international trade theory, and location issues in their review of a body of research. They also recall Kaldor’s (1970) study that highlighted the detrimental effects of economic integration on less developed regions compared to those that were much more developed when integration began. Furthermore, Hansen (1976), referring to Boudeville’s (1972) study, highlights that the strength of an integration pole is due to the following three factors: (1) value creation through activities that create technical accessibility between two regions, (2) the creation of new transport network elements between neighbouring regions that create improved geographical accessibility, and (3) the elaboration of joint urban development planning that improves overall social accessibility. These conclusions, however, underline importance of the institutional and regulatory context provided by the government, which through its instruments are the main coordinator and regulator of economic activities within the national economy. It must achieve quality dialogue, synergy and coordination between policy levels from the bottom up at national and supranational levels (Bianchi et al., 2006).

Richardson (1978) stresses that it is important to consider whether regional growth is “competitive” or “generative". The former assumes growth of the national economy, while regional growth is just the zero-sum of the distribution of output, so that growth in one region is always to the detriment of another. In contrast, generative models treat national growth as the outcome of regional growth rates; therefore, national growth may be higher if regional growth rates improve.

While, as Dunford and Smith (2000) point out, neoclassical, endogenous and ‘radical’ convergence theory looked at uneven development through the experience of ‘advanced’ capitalist economies, there was a parallel discussion about the nature of regional and national inequality in CEECs. Of course, it is not difficult to conclude that absolute convergence occurs only when structural conditions are similar or as long as economies belong to the group of countries with similar initial conditions. With the collapse of socialism, the problems of industrial restructuring and the transition to a market economy, many regions in the CEECs began to compete for resources. As a result, the new economic actors selected regions mainly on the basis of economic variables, leading to new inequalities and leaving individual regions increasingly behind others. As a result, regional reorganisation and redistribution of wealth occurred (Bakus & Ferto, 2019). Differences in development can be explained by (1) macroeconomic variables (such as GDP per capita and GDP growth rate, employment levels), (2) progress in structural reforms and liberalisation, and (3) the

degree of macroeconomic and structural distortions at the beginning of transition (Havrylyshyn & Van Rooden, 2003). Logically, if structural conditions differ, long-run growth rates will also differ and thus diverge (conditional convergence) and GDP per capita will not converge.

Dunford and Smith (2000) assess the appropriateness of interpretations of growth and spatial development by countering the dominant discourse of convergence in neo-classical and neoliberal circles and pointing out that integration carries a number of important territorial 'costs' associated with increasing regional inequalities. Their conclusions are that differentiation is more obvious than convergence, and that convergence will only occur through faster improvement of peripheral regions. The EU is a critical factor for development, overall national transformation in all important aspects of the modern state and economic growth (see more in: Halmai & Vásáry, 2010). However, it is clear that the pace of convergence can vary considerably from region to region and from one Member State to another, especially over a longer period of time, although convergence between regions themselves often appears to be much faster. Senger and Mulquin (2012) claim that economic integration in the EU in practise lowers transport costs and consequently increases the share of turnover that each firm located in the core region can make in peripheral regions. However, as the size of industry in the core region increases, factor prices also increase, as labour is assumed to be immobile across regions. et al. and Arratibel (2007) confirmed that after the 2004 enlargement, the new EU members managed to increase their relative per capita income (including productivity growth due to total factor productivity growth), but that a number of other challenges remained (mainly related to labour migrations and reforms).

Borys et al. (2008) claim that the evidence for "conditional convergence" is much weaker for transition economies. Moreover, they emphasise that classical growth theory (based on GDP per capita growth, education, investment rate, etc.) had almost no relevance for CEE countries. For this reason, the research focus has shifted to analysing the importance of structural factors and institutions. Havrylyshyn and Van Rooden (2003) mention a number of studies that confirm that the negative effects of early and rapid liberalisation were offset by delayed positive effects of transition. Research by Senger and Mulquin (2012) confirms that absolute convergence is observed across EU regions and that an overall decline in disparities in the EU is largely the result of convergence between countries rather than within countries. Experience and research have confirmed that the EU internal market and cohesion policy instruments have been important drivers of regional development and convergence. Borys et al. (2008) emphasise the need to understand the convergence of EU member states in a somewhat broader context than is often the case – primarily in terms of GDP and lagging behind the average. They point to indicators of so-called "structural convergence" or "institutional development and structural reform" as extremely important indicators of convergence.

3. Research methodology

Econometric analysis of the interdependence between the quality of the institutional and regulatory framework and the absorption of EU funds and economic growth was

performed using a fixed effects panel regression. The quality of the institutional framework was analysed using a selection in the ten observed countries (Croatia, Slovakia, Hungary, Poland, Slovenia, Malta, Latvia, Cyprus, Lithuania and Estonia). These countries were selected based on the fact that they share similar historical and economic context, as well as the fact that all of those were EU member states from the year 2004 (only exception is Croatia). It can be assumed that the variables significant for the increase in absorption potential and economic growth apply equally to all countries in the sample. In this research we employ two regressions based on the two dependent variables reflecting absorption rate of EU funds and economic growth. First dependent variable comes in two specifications, as share of payments received from cohesion policy in GDP and the share of payments in total central government revenue. The first two dependent variables show dynamics of the EU fund absorption and second dependent variable denotes economic development (growth) dynamics. It is presented in three specifications as GDP in current prices, GDP in purchasing power standard per capita and GDP growth rate. The intention was to control for the potential effects of migration (declining population), purchasing power standard as well as potential differences in level or rate of economic growth. In each specification, we also use control data – fiscal position (government debt and deficit, as well as overall perception of government performance) to control for the overall stability of the particular country.

The general form of the fixed effects panel regression model is given by the following equation:

$$Y_{it} = \alpha + \beta X_{it} + u_{it}$$

where Y_{it} o is the vector of dependent variables, or the share of payments received from cohesion policy in GDP or in total central government revenues (or GDP growth – GDP growth rate or GDP per capita), X_{it} is the vector of independent variables of the quality of the institutional and regulatory environment, and u_{it} is residual deviation that consists of two expressions – γ_{it} by which we control the specific characteristics of each country in the sample, and υ_{it} represents a random deviation. Prefix i refers to a particular country, and t to a particular year within a panel sample of selected countries. The fixed-effects panel regression model is commonly used by researchers when evaluating a model based on data that are not randomly selected and when there is a high probability that each individual country has specific effects that are correlated with the regressors.

Nevertheless, to make a decision between a random effects or fixed effects model, we used the usual Hausman test (1978) and the Breusch-Pagan test LM (Breusch & Pagan, 1980) with the same result. In almost all model specifications, however, the Hausman test does not provide an answer because the test coefficients were not significant. In one specification, however, there is a clear preference for fixed effect regression. On the other hand, the Breusch and Pagan test indicates the consistency and reliability of fixed effects estimation in all specifications (Tables 1 and 2).

The very fact that all selected countries are recipients of EU grants and that they have a similar history in terms of economic transformation suggests that the chosen method is appropriate. It is also important to note that a large number of

Table 1. Variables of the quality of the institutional and regulatory framework and their effects on the absorption of EU funds.

	CPGDP	CPCGR
DC – Domestic competition	0.0002**	0.007**
	(2.13)	(2.16)
PR – Property rights	0.0004***	0.0016***
	(2.87)	(3.27)
BGR – Burden of government regulation	−0.00013*	
	(−1.71)	
FDGO – Favouritism in decisions of government officials		−0.0006*
		(−1.88)
TGP – Transparency of government policymaking	−0.0002***	−0.0008***
	(−3.08)	(−3.74)
SARS – Strength of auditing and reporting standards	−0.0002**	
	(−2.08)	
CSRD – Company spending on research and development	0.003***	0.001***
	(3.63)	(4.66)
GPATP – Government procurement of advanced tech products	−0.0015***	−0.0008***
	(−2.62)	(−4.12)
EC – Ethics and corruption	0.0005***	0.0025***
	(3.14)	(4.55)
GBB – Government budget balance	0.00005*	
	(1.63)	
GGD – General government debt	0.0002***	0.0006***
	(3.32)	(2.97)
GE – Government efficiency	0.0002*	0.0009**
	(1.86)	(2.28)
PSP – Public sector performance	−0.0009***	−0.004***
	(−3.70)	(−4.46)
Constant	−0.009	−0.027
	(−1.52)	(−1.21)
Hausman test	−104.93[a]	51.45***
Breusch and Pagan LM test	0.00	0.00
R^2	0.58	0.67
Number of observations	109	102

Source: Authors' calculation.
Abbreviations: CPGDP, total paid from Cohesion policy/GDP, in %; CPCGR, total paid from Cohesion policy/Central government revenues, in %; T-values show the significance of the coefficients of variables at the ***1%, **5%, *10% levels.
[a]In this case, the data failed to meet the asymptotic assumptions of the Hausman test.

independent variables of the institutional and regulatory environment were included in the analysis, which were reduced by the elimination method to the variables presented in the following tables. The elimination of variables was guided by the criteria of significance of the influence of a single variable on the dependent variable and the level of R2 (as an indicator of the degree to which the model itself explains the changes in the dependent variable). This was done to avoid the use of more complex econometric methods that take into account the elimination of multicollinearity problems that occur in data samples such as the present one, in which a very large number of independent variables are used in a relatively small sample (small number of countries and time periods).

It is also important to note that the fixed effects panel regression model, by its very nature, explains the relationships between the dependent and independent variables over time, that is, it assesses the effect of the independent variable on the dependent variable over time. For example, does an increase in the absorption of EU funds contribute to economic growth, or does an improvement in some key institutional variables contribute to an increase in the absorption of EU funds. Some works

Table 2. Variables of the quality of institutional and regulatory framework and their effects on economic growth.

	GDPPC	GDPPPS	GR
CE – Corporate ethics	−0.02*		
	(−1.75)		
JI – Judicial independence	0.002*		
	(1.92)		
WGS – Wastefulness of government spending	−0.004***	−0.004***	−0.064*
	(−5.03)	(−5.19)	(−1.67)
PR – Property rights		−0.04***	
		(−3.44)	
DPF – Diversion of public funds		0.002*	0.17***
		(2.00)	(3.05)
BGR – Burden of government regulation	0.003***	0.001*	
	(3.86)	(1.97)	
SARS – Strength of auditing and reporting standards			0.098***
			(2.95)
GPATP – Government procurement of advanced tech products		0.002***	
		(3.96)	
EC – Ethics and corruption		−0.07***	−0.28***
		(−4.52)	(−3.42)
GBB – Government budget balance	−0.001***	−0.001***	
	(−4.09)	(−4.10)	
GGD – General government debt	0.001**	0.002***	
	(2.23)	(3.61)	
PSP – Public sector performance		0.007***	
		(3.18)	
PSB – No. of procedures to start a business	−0.0015**		0.06*
	(−2.39)		(1.99)
DSB – No. of days to start a business	0.008*		
	(1.82)		
Constant	9.54***	9.98***	7.54***
	(156.53)	(224.02)	(2.49)
Hausman test	−103.06[a]	−69.01[1]	−17.80[a]
Breusch and Pagan LM test	0.00	0.00	0.00
R^2	0.57	0.71	0.31
Number of observations	91	100	91

Source: Authors' calculation.

Abbreviations: GDPPC, GDP, current prices, euro per capita; GDPPPS, GDP, current prices, purchasing power standard per capita; GR, gross domestic product growth rate, %. Note: t-values show the significance of the coefficients of variables at the *** – 1%, ** – 5%, * – 10% levels.

[a]In this case, the data failed to meet the asymptotic assumptions of the Hausman test.

(Țigănașu et al., 2018) focus on administrative capacity as a significant determinant of funds absorption. In this context, the importance of evaluating the absorption of EU funds and the influence of administrative capacity is pointed out (Incaltarau et al., 2020). Moreover, the authors point out that the recent recession (after 2008) has reduced the capacity of countries to absorb EU funds. Contrary to the authors' expectations, national fiscal capacity and political decentralisation have not proven to be decisive factors in the absorption of funds. Therefore, the recommendation is to strengthen administrative capacity to increase the absorption rate.

The fixed effects panel regression model is based on a number of independent variables obtained from official sources. In terms of selection of the independent variables, we use approach of Buterin et al. (2017), which investigate influence of institutional' reforms on economic growth of the new EU member countries. However, in their research, they use much less variables, such as Heritage overall index of economic freedom, government effectiveness indicator, rule of law indicator,

corruption perception index and index of institutional reforms in transition countries. In our research, the vast majority of the variables are based on the World Economic Forum's Global Competitiveness Index (GCI), while others refer to indicators from the Doing Business report. Official Eurostat data referring to the development of GDP and data from European Commission referring to the absorption rates of EU funds in the countries analysed have also been used.

4. Empirical results and discussion

The variables of the quality of the institutional and regulatory framework are analysed to determine their effects on the absorption of EU funds, and the results are presented in Table 1. These effects are observed in relation to two dependent variables – the share of payments received from cohesion policy in GDP (CPGDP) and the share of payments in total central government revenue (CPCGR). Although it was expected that the level of funds received, observed in shares (due to the fact that there is a quite constant empirical relation between government revenue and GDP), would be relatively consistent in both variables, it still differs to some extent. In particular, a high absorption rate leads to a high share of payments in total central government revenue. However, if EU funds are not used for projects that contribute to economic growth, despite a high absorption rate, other effects are possible when it comes to the ratio of funds received and economic growth rates achieved. It is also interesting to see which of the institutional and regulatory environment variables have significant effects on the macroeconomic indicators. At first sight, it is surprising that most of the institutional and regulatory environment variables are positively correlated with the share of EU funding received.

For a correct interpretation of the results, it is important to mention that an increase in the country's ranking within a given institutional environment variable means a decrease. Therefore, a positive coefficient of the elasticity of a single variable and a dependent variable means that a decrease in the quality of a single indicator leads to a higher rate of absorption of EU funds. Of course, such a conclusion is associated with some other processes that may be indirectly related to the absorption of EU funds. For example, the results show that a decrease in domestic competition (DC) has a positive effect on the rate of absorption of EU funds. During the observed period, some countries (notably Croatia, Hungary and Slovakia) accelerated the absorption of EU funds.

The econometric analysis shows that the interdependence between the absorption of EU funds and the quality of the institutional and regulatory system is an extremely complex issue and great caution should be exercised in interpreting the results. A priori, one might expect increased absorption of EU funds to be associated with improved rankings on indicators of the quality of the institutional framework. However, this is often not the case, as some of the indicators of absorption are not significant, while for some indicators it can be assumed that increased absorption leads to their decline. For example, the indicators "domestic competition" (DC) and "property rights" (PR) are positively correlated with the increase in the absorption rate of EU funds, i.e., the sum of funds paid from cohesion policy in relation to GDP

(CPGDP). The question arises whether it is possible that increased absorption of EU funds reduces domestic competition. The variables "burden of government regulation" (BGR), "favouritism in decisions by government officials" (FDGO) and "transparency of government policy making" (TGP) are associated with government activities and all three show a negative relationship: a better ranking in these indicators increases the absorption of EU funds, i.e., CPGDP. That is, these indicators have a negative coefficient, indicating that improving their quality increases the rate of absorption of EU funds. In other words, the negative coefficient of administrative burden shows that, for example, complicated administrative procedures cause difficulties in the absorption of EU funds, i.e., the reduction of administrative burden increases the absorption of funds. Therefore, it can be concluded that the reduction of administrative burden has a positive effect on the dynamics and level of funds absorption.

The regression coefficient of the business expenditure on research and development (CSRD) variable indicates a positive relationship with the share of support received from EU funds, i.e., a decrease in business expenditure on research and development has a positive effect on the absorption of EU funds. Such a conclusion, although surprising at first sight, is to some extent expected. Indeed, increased spending of EU funds on R&D implies more funds from the EU, which partly compensate for national funds. Therefore, the total amount of investment may increase although the amount of national investment may decrease, which is also true for firms. For this reason, the total cumulative effect of investment would also contribute to a higher absorption of EU funds. On the other hand, the improvement of "government procurement of high technology products" (GPATP) has a negative relationship with the share of support received from the EU. In other words, improving government procurement of high technology products has a positive effect on absorption. Although this may be partly related to the development of an information system to monitor the implementation of EU funds, such a conclusion may also be related to some other processes that must be related to the modernization of public administration rather than directly to the absorption of EU funds. It is also possible that additional EU funds enable the procurement and use of advanced technological products that otherwise would not have been available due to limited national fiscal resources.

The variable "ethics and corruption" (EC) shows a positive relationship with absorption. In other words, a deterioration in the ranking on ethics and corruption increases the absorption rate, i.e., total payments from cohesion policy as a percentage of GDP (CPGDP). Indeed, a decrease in the ethics and corruption indicator is positively correlated with the share of support from EU funds, i.e., a decrease in this indicator has a positive effect on the absorption rate of EU funds. However, such a conclusion, suggesting that ethically questionable actions facilitate the implementation of EU projects and intensify the withdrawal of EU funds, is very likely to be associated with some other processes that may not be directly related to the absorption of EU funds. It is possible that intensifying the procurement, preparation and implementation of EU projects increases the risk of corruption.

It is also interesting to note that the "government budget balance" (GBB) and the "general government debt" (GGD) show a positive statistical relationship, i.e., a decrease in the ranking of these indicators increases the absorption rate, i.e., the total

payments from the cohesion policy funds in relation to GDP (CPGDP). More precisely, a decline in these indicators has a positive correlation with the share of support from EU funds, i.e., a decline in these indicators increases the absorption rate of EU funds. Therefore, it can be concluded that a decline in the government budget balance and debt growth has a positive effect on the dynamics and level of absorption of EU funds. This dependence can be explained by additional borrowing to co-finance EU projects, especially if they are high-value long-term projects (infrastructure projects). This can be used to intensify project implementation and drawdown of EU funds.

A decrease in the government efficiency indicator (GE) correlates positively with the share of support from EU funds, i.e., a decrease in this indicator increases the absorption rate of EU funds. This suggests that a decrease in government efficiency has a positive effect on the dynamics and the level of absorption of EU funds. This is possible if EU funds are directed to projects that do not contribute enough to the economic and social recovery of the country. Thus, increased absorption of EU funds does not necessarily improve the efficiency of the government. Moreover, an increase in the public sector performance (PSP) indicator increases the absorption rate of EU funds. More specifically, improvement in the PSP variable has a negative correlation with the share of support received from EU funds, i.e., an improvement in this variable increases the absorption rate. Therefore, it can be concluded that the improvement of public sector performance facilitates the implementation of EU projects, since public institutions are recipients of EU funds and their efficiency contributes to the quality of preparation and implementation of EU projects and the overall absorption of EU funds.

Finally, in the context of the effect of the quality of the institutional and regulatory environment on the rate of absorption of EU funds, it is important to note several variables that relate to the quality of government: Burden of government regulation, favouritism in decisions by government officials, transparency of government policy making, public sector performance, and government efficiency. These independent variables largely reflect the national system of managing EU funds, whose quality, functioning and efficiency are crucial for the effective allocation of EU funds and good dynamics of their absorption. The research shows that almost all observed variables have a negative statistical relationship with the absorption of EU funds, indicating that good absorption is related to the improvement of these indicators. This is not a surprise, but a confirmation of the importance of creating an optimal and functioning institutional system for the implementation of regional policy funds, so that the projects prepared for implementation contribute to economic growth and increase the dynamics and level of absorption.

The results of the analysis of the effects of the variables of the quality of the institutional and regulatory framework on economic growth are presented in Table 2. These effects are observed in relation to three dependent variables of economic growth: GDP, current prices, per capita (GDPPPC); GDP, current prices, purchasing power standard per capita (GDPPPS); and GDP growth rate (GR). Although the results are largely consistent, there are some discrepancies. It should be remembered that the countries observed had significant population out-migration in some years,

so that all the variables given, although indicating economic development, have slightly different dynamics.

The results of the analysis suggest that a decrease in the indicator "judicial independence" (JI) has a positive effect on economic growth expressed in GDP per capita. However, in the context of EU funds, this indicator is not important in the process of preparation and implementation of EU projects, but in the case of a possible legal dispute related to projects and other economic activities. The question arises as to the impact of EU funds on the judiciary itself. It is obvious that the increased inflow of EU funds contributes to GDP growth but has no positive effect on the judicial system. Such a conclusion points to another possible area where EU funds could be used –strengthening judicial institutions and improving the rule of law. The lack of independence of the judiciary can lead to long-term negative consequences for the country's development, even if the negative effects are not evident in the short term (partly due to the positive effects of EU funds). Moreover, the analysed data show that an increase in growth, i.e., GDPPPS, is negatively correlated with property rights (PR). Therefore, it could be concluded that the protection of property rights contributes to economic growth, which is one of the most important statements of modern theories of economic growth. Improving the position of each country in this area could be included as a goal in the design of new programmes.

From the analysed data, it is evident that an increase in the growth rate is negatively correlated with "wasteful government spending" (WGS), i.e., an improvement in the "wasteful government spending" indicator has a positive effect on the economic growth rate. This conclusion is to be expected as meaningful, productive and targeted investments contribute to socio-economic recovery. In addition, a positive correlation was also found between economic growth and the following two indicators: 'diversion of public funds' (DPF) and 'burden of government regulation' (BGR). Both indicators are positively correlated with economic recovery, i.e., a decline in these indicators has a positive impact on GDP per capita and the economic growth rate. Such a conclusion does not seem overly justified, as poor use of public resources and regulatory burdens do not contribute to overall economic recovery and represent wasteful use of a country's human and financial capacities. However, this does not necessarily mean that a decline in these indicators has a positive effect on economic growth – it just means that it is not sufficient on its own to stop economic growth. More specifically, a positive business cycle and EU funds increase the growth rate; however, the question is what the growth rate would be if regulatory burdens were reduced and the distribution of public funds were improved.

The model shows that a decrease in the indicator "government procurement of high technology products" (GPATP) has a positive effect on the level of economic development expressed in GDP per capita and GDP growth rate. From the analysed data, it can be concluded that procurement initiatives that promote innovation are positively correlated with GDP per capita, i.e., a decrease in this indicator contributes to GDP growth. This shows that the improvement in this indicator, although related to increased absorption of EU funds, may not be sufficient to increase high-tech procurement in countries with higher growth rates. In this context, the question arises to what extent economic growth supported by EU funds masks a decline in

competitiveness compared to other, more developed countries. The model calculation shows that an increase in the indicator "ethics and corruption" (EC) has a positive effect on economic growth, expressed in GDP per capita and economic growth rate. From the data of the model, it can be concluded that the variable "ethics and corruption" is negatively correlated with economic growth, that is, the improvement of the indicator "ethics and corruption" has a positive effect on GDPPC and GR. This can also be associated with the reduction in the size of the shadow economy and the increase in funds diverted to legal flows, which contributes to the overall economic recovery. In contrast, the relationship between EU funds received and the ethics and corruption indicator is opposite. This could suggest that the increase in EU support leads to a decrease in the "ethics and corruption" indicator.

For the variables "government budget balance" (GBB) and "government debt" (GGD), the calculation shows that the improvement of both indicators affects the level of economic growth expressed by GDPPC and GDPPPS. From the data of the model, it can be concluded that the first variable is negatively correlated with the rate of economic growth, i.e., the improvement of the indicator "fiscal balance" has a positive effect on GDPPC and GDPPPS, while government debt is positively correlated with GDP. This can be associated with stable fiscal policy, i.e., a reduction in the fiscal deficit and a reduced need for further borrowing, all of which contribute to the overall economic recovery as the fiscal capacity to finance investment increases. Conversely, debt accumulation can have a positive impact on growth if the funds are used productively for projects that contribute to growth and development. From the results of the empirical model, we can conclude that the public sector performance (PSP) variable is positively correlated with the rate of economic growth, i.e., a decrease in regulatory burden and the efficiency of the legal framework in resolving disputes has a positive effect on the GDPPPS. This relationship is somewhat surprising; however, given that many other variables influence economic recovery, one might conclude that the influence of this variable is quite limited.

For the variables "number of procedures to start a business" (PSB) and "number of days to start a business" (DSB), the model shows that the improvement of the indicator "number of procedures to start a business" has a positive effect on the level of economic growth expressed by GDP per capita and GDP growth rate. From the data of the model, it can be concluded that the variable on the indicator "number of procedures to start a business" is negatively correlated with the level of economic growth, i.e., a reduction in the number of procedures has a positive effect on GDP at purchasing power parities. This result is to be expected as the reduction facilitates entrepreneurship, but the contribution to economic growth is still marginal. In contrast, it is somewhat unexpected that the econometric model shows that a decrease in the "number of days to start a business" indicator is positively correlated with the level of economic growth. In other words, an increase in the number of days to start a business has a positive effect on GDP per capita. In a way, this is surprising; however, one should keep in mind that many other variables influence economic recovery, so one could conclude that the influence of this variable is still quite limited as it relates to business start-ups.

In conclusion, in the context of the impact of the quality of the institutional and regulatory environment on economic growth, several variables are important. These include improved protection of property rights, reduced wasteful government spending, and improvements in ethics and anti-corruption practises. This is not a surprise, but rather a confirmation of the effect of positive processes on the economy. Some variables are somewhat unexpectedly positively correlated with economic growth, such as "public sector performance" and "government procurement of advanced technology products". Nevertheless, it can be concluded that economic growth is even more influenced by some other measures and indicators.

5. Conclusions

The paper has attempted to provide answers to two research questions. Regarding the first one, which refers to whether the quality of a country's institutional and regulatory environment matters for the level of absorption of EU funds, the econometric analysis of the quality of the institutional and regulatory environment and its influence on the absorption of EU funds shows that most (7 out of 13) independent variables of the institutional and regulatory environment are positively correlated with total payments from cohesion policy as a share of GDP (CPCGR). A positive coefficient of elasticity between an independent variable and the dependent variable indicates that a decline in the quality of a single indicator has led to an improved absorption of EU funds. Specifically, we show that the burden of government regulation, favouritism in decision-making by government officials, transparency of government policymaking, public sector performance, and government efficiency are critical for effective allocation of EU funds and good dynamics of their uptake.

Regarding the second research question, whether institutional and regulatory quality increases economic growth, the analysis shows that most (8 out of 14) independent variables of institutional and regulatory environment are positively correlated with the level of economic growth (expressed by GDP per capita at current prices, GDP at PPP at current prices, and real growth rate). A positive coefficient of elasticity for a single variable and the dependent variable indicates that a decline in the quality of a single indicator has increased GDP per capita and economic growth. Improved protection of property rights, reduced wasteful government spending, and improvements in ethics and anti-corruption, public sector performance, and government procurement of high-technology products also have a direct positive effect on economic growth. Thus, this study provides clear policy guidance for recipients of EU funds.

These results suggest that the EU funds received (along with the positive effect of economic development) have increased economic growth and development in EU countries; however, the allocation of funds has not necessarily increased the quality of the institutional framework and competitiveness in these countries. Thus, it can be confirmed that it is important to create an institutional framework for the management of EU funds that not only increases the absorption rate, but also improves the overall performance of the public sector and the competitiveness of the country.

Failure to use EU funds appropriately and productively can have negative long-term effects on the development of recipient countries.

As McCann et al. (2020) notes, a policy response is needed as "levelling" in the context of the "geography of discontent." Koster et al. (2020) find evidence of positive effects of economic diversity in the broader region on employment growth, but this may indicate a lack of market power or absorptive capacity in some regions, as some larger firms are able to capitalise on knowledge spillovers. EU financial support from regional funds is highly dependent on scenarios for the implementation of structural reforms (Crescenzi & Giua, 2020; Roeger et al., 2008), in particular valuation scenarios using a dynamic model with endogenous growth and human capital accumulation (for more information, see: Varga & In 't Veld, 2010). The conclusions of this model complement the conclusions of the econometric analysis conducted for the purposes of this paper. In particular, it was found that in the long run, positive effects on the absorption of EU regional funds in less developed EU regions can be expected due to income and output growth, as investment and consumption increase in the short run. Thus, the paper's findings show that there are significant benefits to devoting a portion of EU funds to structural and administrative reforms, which is precisely the direction of the current EU framework. A higher quality institutional and regulatory framework has significant implications for economic development. These benefits are related to higher absorption and effectiveness of EU grants and an increase in overall productivity of the economy. The contribution of this study is to identify specific determinants of institutional quality that affect absorption performance and economic growth. Therefore, there are clear benefits for individual countries to direct their administrative efforts toward improving these areas.

One of the major limitations of the study is the narrow study sample, which does not cover the pre-accession period of the member countries. By expanding the time period, there are other econometric methods that can improve the credibility and robustness of the results. In addition, there are a number of other social and macroeconomic variables that can complement the basic model and provide a more detailed explanation of the economic convergence dynamics affected by the allocation of EU funds.

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There are no competing or conflicts of interest to declare.

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