

**Institutional reforms'
impact on economic growth
– case of Croatia and
selected EU members**

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INSTITUTIONAL REFORM'S IMPACT ON ECONOMIC GROWTH – CASE OF CROATIA AND SELECTED EU MEMBERS¹

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ABSTRACT

The aim of this paper is to research, theoretically and empirically, the impact of institutional reforms on the economic growth in transition countries (new EU members) and Croatia, in the period from 1996 to 2012. In order to prove the hypothesis, we will use panel analysis of transition economies and Croatia, namely the Arellano-Bond dynamic panel analysis. The analysis includes two dependent variables (GDP/pc and the share of export in GDP) and five independent variables (total Heritage Index of Economic Freedom, WGI government effectiveness indicator, WGI rule of law indicator, corruption perception index and the index of institutional reforms in transition countries). The results show that there is a significant positive impact of institutional reforms on the

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economic growth of transition countries and Croatia, which creates preconditions that are essential for the future growth rate of Croatian economy.

Keywords: institutions, institutional reforms, economic growth, transition countries, Croatia, Arellano-Bond dynamic panel analysis

1. INTRODUCTION

The institutions and the state in the broadest sense have a strong impact on the economy due to the possibility of creating an enabling environment for economic growth and development. Institutional changes aim at adapting to new challenges. In the scientific and professional literature, the interest to discover the causes of institutional differences between the countries, as well as the ways in which institutions can affect economic performance, has increased. Likewise, the two-way causal link of institutions and development has become the subject of interest, so that the possibility that institutions affect economic development is more emphasized, as well as the idea that the economic development leads to qualitative institutional changes. With the development and progress of a country, the needs of existing organizations are also developing, and therefore they will try to change the institutional framework to achieve even better performance. The lack of implementation of institutional reforms can lead to a lack of positive development effects, which in turn can lead to far-reaching macroeconomic consequences on investment, technological development, employment and the overall economic growth and development. Therefore, this paper will present comprehensive analysis of institutional reforms, define the most important problems and offer appropriate solutions. Using scientific methods, this paper will prove that there is a significant positive impact of institutional reforms on the economic growth of transition countries (new EU members) and Croatia, which implies the following: 1. that there is a positive correlation link between institutional development, economic growth and growth in exports. Support of relevant institutions has a positive impact on achieving better economic results. 2. Development of informal institutions is a long process and their

change takes years. Countries with similar informal institutions and macro-economic, demographic and other settings have certain common characteristics. Such an approach does not preclude the view that each country must develop their own ways of implementing institutional changes because, due to the specific characteristics of each country, simply copying and implementing the model might be unsuccessful and inefficient. 3. The institutions that are directly related to the transaction costs, such as the efficiency of government but also institutional segments that directly affect economic activities, such as the level of competitiveness, have the influence on the economic performance of transition countries, including Croatia. Improving the performance of such institutions would result in better economic results of Croatia. Transition countries represent a group of countries with very similar initial conditions and they represent an extremely important sample for the study of institutional reforms' impact on development, because their example can show that institutional changes have significant economic impact. The institutional system that reduces transaction costs provides support for economic growth and development by encouraging innovation, leading to technological progress, which provides an incentive for economic growth and development. This paper consists of four interrelated parts. The first part, Introduction, defines the basic themes and issues of research, raise the hypotheses that are later tested and describes the detailed structure of the work. The second part briefly reviews the literature and theoretical features of the impact of institutional reforms on economic growth. The third part contains a description of the data, methodology and empirical results obtained using the Arellano-Bond dynamic panel analysis. In the fourth and last part of the paper, concluding observations are presented.

2. LITERATURE REVIEW OF INSTITUTIONS' IMPACT ON ECONOMIC GROWTH

Authors who are researching the impact of institutions on economic growth agree that the influence exists and that it can be measured, but there are often differences in the significance of this impact as well as the causes of the growth of institutions and

consequently, economic growth and development. Most authors emphasize the protection of property rights, political freedom, quality and good government, the level of political instability. Institutions are acting through invisible channels, and the fact is that the lowering of transaction costs everywhere was a result of good institutions' performance and that the reduced transaction costs led to economic growth. From a pool of a large number of studies in recent years that prove the impact of institutions on economic performance, only some of the most important papers will be mentioned. The first survey of institutional quality was made by Barro (1991), who included the number of revolutions and assassinations as an indicator of institutional quality in the long-term growth in the period from 1960 to 1985 in 98 countries. He proved positive relationship of institutional quality and economic growth. After his research, the indicators that were used for the assessment of institutional quality were improved, but the principle of econometric models remained mostly the same. Improving the indicators led to the introduction of subjective indicators made by commercial agencies for the needs of international investors. Researches of Mauro (1995) and Knack and Keefer (1995) in the evaluation of institutions included for the first time the following indicators: BERI - *Business Environment Risk Intelligence*, ICRG - *International Country Risk Guide*, and BI - *Business International*. Mauro found a statistically significant relationship between institutions, investment and economic growth. As independent variables, he used corruption, bureaucracy efficiency index and political stability index. The problem of causality was noticed in his research, meaning that there was the possibility that the observed dependent variables were affecting the independent ones. Once the problem had been solved, it was concluded that the higher index of the bureaucracy efficiency led to high rates of growth. Knack and Keefer's research found that the growth and quality of institutions led to higher GDP growth rates. Causality was noted by Chong and Calderon (2000), finding that it was two-way and that the institutions promoted growth, but also that growth itself led to the creation of new, better institutions. This is the principle of backlinks between institutions and economic growth. The authors have shown that the impact of institutions on economic growth was higher in poor countries. Research of Rodrik, Subramanian and Trebbi (2002) showed that the importance of quality institutions for economic growth outweighed the importance of geographical location and

level of integration. In that research, the institutions were measured by the rule of law and protection of property rights. They proved the great importance of institutions for economic growth. Easterly, Ritzen, and Woolcock (2005) proved that the level of social cohesion was essential to generate trust and patience necessary to conduct reforms. Citizens must trust the government that short-term losses that inevitably accompany the reforms would be generously compensated by long-term gains. Good institutions have a crucial role in that trust. Consequently, good institutions lead to economic growth. The fact that differences in economic institutions are a fundamental cause of economic development is proven by Acemoglu in his researches, where he also distinguishes economic and political institutions. Economic institutions in the country determine the initiatives and restrictions for all economic activity and shape economic results. As such, they are also a matter of social choice, because of the consequences they make. Since various interest groups and individuals have benefited from various economic institutions, there is usually a conflict about social choices, which is ultimately resolved in favor of those groups with greater political power. The distribution of political power is determined by distribution of political institutions and the distribution of resources. Political institutions allocate *de iure* political power, while groups with greater economic power generally have a greater *de facto* political power. Political institutions and the distribution of resources change over time, as economic institutions influence the redistribution of resources and as the groups that today have *de facto* political power are trying to change political institutions to increase their *de iure* political power in the future. Economic institutions that foster economic growth arise when political institutions allocate power to the groups whose interests are in preserving and protecting the property rights of all who are the owners of goods, when they seek to create effective constraints for the holders of political power, and when there are relatively few rents that might devolve to the holders of political power. In another study, Acemoglu (2005) answers the question of whether the erroneous and distorted macroeconomic policies of some countries that included high inflation, high budget deficits and unrealistic exchange rates led to macroeconomic instability and slow growth in the aftermath of World War II, or whether there was another cause. According to him, the countries that followed the bad and inconsistent macroeconomic policies had weak institutions, including political ones,

which did not restrict politicians and political elites, which were inefficient in terms of protection of property rights for investors, who have favored the spread of corruption and the high degree of political instability. Once the control of the effects of institutions is taken, macroeconomic policy can only have a minor impact on the instability and crisis. According to him, the wrong macroeconomic policies are symptoms of existing institutional problems, not the main cause of instability. Existent institutional problems are reflected in the economy through a number of channels, microeconomic as well as macroeconomic. Therefore, the cause of slow growth lies in institutions, and the macroeconomic policies that are not conducive to the growth are their consequence. Ulubasoglu and Doucouliagos (2004), exploring the relationship of institutions and economic growth on the model of 119 countries, found that overall there were significant direct and indirect effects of political and economic freedom on economic growth. In this, economic freedom has a positive and significant effect on productivity, capital accumulation and on the growth of the labor force and human resources. Vijayaraghavan and Ward (2001) examined the relationship of institutional infrastructure and the rate of economic growth among the 43 countries between 1975 and 1990, reaching the conclusion that most important for the economic growth were institutions of protection of property rights and the size of government. However, they called for caution in interpreting the results on the size of government by pointing that the state should allow economic processes, but should also have the incentive and regulatory role. In this respect they emphasize that it should not be construed that smaller governments are more efficient. Furthermore, studying the economic growth of OECD countries, based on analysis of time series, Bassanini, Scarpetta and Hemmings (2001) found that the role of an institution may be positive or negative. Positive because innovation, macroeconomic environment, trade openness and development of financial markets influence the economic growth, which is a result of good institutions. The negative impact appears in weak institutions, where strict regulations and administrative restrictions on market efficiency result in a negative impact on overall economic growth. The difference in the quality of institutions will influence the difference in economic growth. Meon and Weill (2003) find that better institutions are associated with greater macroeconomic performance, and that the rule of law and the effectiveness of government have the

greatest influence. Instead *institutions* they use the term *governance*. The term governance does not stand for any rule of political type or for the management, but the term itself is wider and includes the rule of law, corruption and other categories which are in this paper considered as institutions. Control of corruption and regulatory framework also plays a role, but according to them, this role is less significantly associated with efficiency. The rule of law is an institution that will in each country have an important influence on economic performance and therefore it should be encouraged, but each country should develop its legislative and institutional framework adapted to the specific situation, the achieved level of development and informal institutions that rule in the country. Such thinking is confirmed by the research of David and Mach (2006) that proves two things on the Swiss example: first, that in Switzerland's rapid growth and successful international integration during the second half of the nineteenth and the first half of the twentieth century the crucial role was played by political and economic institutions and, second, that the fact that Switzerland did not have institutions like the patent law and an independent central bank was also important, although these institutions were largely considered as a prerequisite of development. Therefore, through the development of its own path instead of copying someone else's way of institutional changes, Switzerland has achieved economic success. This is particularly important in the context of seeking out particular ways of institutional change. Also, Roy and Tisdell (1998) agree that good institutions are necessary for sustainable development and that their implementation and incorporation into society is essential. They do not put much emphasis on the choice of institutions. According to them, the ways of implementation should not be adopted and copied by others because something that was successful in one society or period will not necessarily be equally successful in different circumstances. Very extensive research by Kaufmann, Kraay and Zoido-Lobatón (1999) was conducted in over 150 countries and provided empirical evidence of a strong causal relationship between the institutions and better economic results. By observing more than 300 individual indicators of institutions sublimated into six main groups, they concluded that better institutions led to better economic results. Their research is very often used and cited in scientific research and is one of the most important contributions to the issue of the impact of institutions on economic growth. Their database of indicators of

institutional development, which is regularly updated, is very often used in recent researches. In this paper, in estimating the impact of institutions on economic performance in transition countries, two of the six indicators the above mentioned authors developed, will be used. Studies on the impact of institutions on economic growth are numerous, and only some are given here. It is possible that some studies that would show that impact even more vividly have been omitted, as well as some that might be for some reason even more important. Authors generally agree that the impact of institutions on growth exists, differing in whether they used the indicators of commercial institutions, data from available databases or created their own indicators. Research results vary in the degree of impact on growth as well as in the degree of influence of each institution. While some authors emphasize the institution of property rights, others are more inclined to the institution of the rule of law, still others prefer the absence of corruption and reducing bureaucracy. But in spite of criticism and taking into account the constraints, most of them ultimately agree on one thing: good institutions have a positive effect on economic performance. However, there is no consensus on how good institutions can be reached. How do they occur? How to encourage their growth? How to encourage institutional change to make it have a positive effect on growth? There is no simple and unequivocal answer to these questions, and can be none, since each country has to find its path of institutional changes. It is very difficult to look up to a developed country and its institutional framework and to try to replicate it in one's own terms and conditions. Even if the adoption of laws and regulations can formally succeed, the effects would not be the same as in the original country. What probably applies for all countries is the need to protect property rights and the need to implement the rule of law. It is probably useful for all countries to prevent corruption as much as possible and to ensure the contract implementation. These are the good institutions that each country needs to develop and continuously improve. These are the institutions that reduce transaction costs, and whose level can be identified relatively quickly. Regardless of the level of economic development of the country, it has been proven that those institutions act in a positive direction. Criticism of the studies on the impact of the quality of institutions and economic growth is mainly related to the quality of the data, because there are no direct measurements of the quality of institutions (Bađun, 2005), instead they are indirect and

derivative. The data used are subjective and therefore are susceptible to a dose of inaccuracy. Data mainly comprise perceptions, which is the main objection for their use. However, data on institutional development obtained in this way, are still very useful in practice because they provide sufficient information. In fact, for domestic and foreign investors, perceptions are important because the perception of security can be more important than the formal existence of some law. Subjective indicators often show the degree of implementation of formal institutions, and according to that they may to some extent be regarded as relevant. Also, the collection and analysis of data is constantly improving and developing. A particular problem is the circular causality and feedback effect of economic growth on the growth of institutions. It is possible that variables that would at the same time explain both the economic growth and the institution, which would in such case result with apparent regression, are excluded from the survey. It is also noted that when short periods of time are used, cyclical movements of GDP are ignored. Surely there is more criticism and limitations related to the research of the impact of institutions on economic growth which should be considered. There needs to be an awareness of all of these limitations when interpreting the results of research of the impact of institutions on economic growth. Research should be used in order to determine the direction, and to find out how to enable more effective impact on economic growth.

3. DATA

In the empirical part of the study longitudinal data with the spatial and temporal dimensions are used. The ways in which institutions affect economic growth are numerous and ambiguous and they act through the various and numerous channels. For the purposes of this model it is important to show that the institutions have an important role in the economic growth of Croatia and transition countries and that their increase may contribute to increased economic growth. In this regard, the impact of institutions on the gross domestic product per capita (GDP/pc) for the observed countries will be examined. In studies of this kind the question whether it is better to use the average rate of growth of real GDP (average growth rates used are for example, Barro, 1991;

Vijayaraghavan and Ward, 2001) or it is better to use the level of GDP per capita often arises. Due to the short time of observation and because of the large and dynamic changes in the economy that transition countries have passed, it is more appropriate to use the level of GDP/pc (Acemoglu, Johnson and Robinson, 2004; Pritchett, 2012). Because of the need of comparability arising from the same data collection methodology for all countries observed, for the data on GDP per capita the database of the World Bank was used and for the purpose of comparability the data have been presented at constant prices from year 2010. Next dependent variable that is observed is the share of exports in GDP. Croatia has so far attracted significant amounts of foreign direct investments, but these investments were in the so-called nontradable sector and have not produced positive spillover effects (Bilas, Franc, 2006 Lovrinčević, Marić, Mikulić, 2005; Babic, Pufnik, Stučka, 2012), nor contributed to the remarkable increase in production and exports, as opposed to institutionally more advanced transition countries for which this was the case. Therefore, this paper does not study the influence of institutions on attracting investment but on the share of exports in GDP. Numerous authors have proved that institutions influence the attraction of investment and the investment activity in the country in general (Kumar, 2007; Alfaro, 2003; Botrić, Škuflić, 2006; Zakharov, Kušić, 2003). Investments that contribute to technological progress, production and exports are directly in the function of economic growth. For this reason, this paper explores the connection between institutions and exports in the observed transition countries. The achieved institutional development is taken as the independent variable in the panel analysis. In this sense, composite index Heritage overall index of economic freedom is used in the model. It represents an unweighted average value of 10 separate freedom indexes, namely: business freedom, trade freedom, monetary freedom, fiscal freedom, property rights, freedom from government influence, investment freedom, financial freedom, freedom from corruption and freedom of the labor force. Professional authority of the Heritage Foundation has a major impact on the formation of attitudes of western investors about economic policies, political stability and institutional development of the surveyed countries (Baletić, Budak, 2007). Furthermore, the Heritage Index of Economic Freedom is extensively quoted and it stands for a popular measure of assessing progress in market reforms. It is very useful for testing and comparing the institutional development, as the

set of indicators used is based on a methodologically consistent, internationally comparable databases. In the model, the EBRD index of institutional reforms in transition countries is also used. Since special attention in this paper is paid to this index, it is useful to decompose the index in order to allow more detailed analysis of individual impact of certain indexes on economic growth. The index of institutional reforms in transition countries presents evaluations of the EBRD's Office of the Chief Economist of the progress of the countries in transition. Determining the value of the index is based on a classification system that was developed in 1994. Indexes assume values from 1 to 4+, where 1 represents a slight change from the status of a rigid planned economy to 4+ which indicates the level of standards of developed market economies. Estimates are made in six areas:

1. Privatization of large systems
2. Privatization of small and medium-sized enterprises
3. Quality of government and enterprise restructuring
4. Price liberalization
5. Trade and foreign trade
6. Competitiveness

The next indicator used to evaluate the impact of the rule of law on the dependent variable is Worldwide Governance Indicators (WGI) - Rule of Law indicator. It is an indicator which is published by the World Bank, reflecting the extent to which there is a confidence that the rules will be respected, and in particular to which the contracts will be enforced and property rights protected. It reflects the level of confidence in the police, judiciary and the possibility for the occurrence of crime and violence. In addition to the above, this paper also used the indicator of the effectiveness of the government (Government Effectiveness), which reflects the perception of the quality of public services, civil society and the degree of its independence from political pressures, the quality of the formulation of policies and their implementation, and the credibility of the government's commitment in the framework of the implementation of such policies. It should be noted that WGI consist of six separate indicators that reflect institutional

development. Besides these indicators, there are still Voice and accountability - freedom of opinion and responsibility of governance, Political stability, Regulatory quality - the quality of legislation and Control of corruption (Kaufmann, Kraay, Mastruzzi, 2010; Kaufmann, Kraay, Zoido- Lobaton, 1999). Although there are numerous studies in which these indicators are weighted and added together to obtain a single indicator, the authors of WGI indicators insist on the separation of each parameter, emphasizing that they are not intended to form a composite index and that thus calculated composite index gives a distorted picture of institutional development (Arndt, Oman, 2006). Databases supporting each of these indicators include more than 300 individual consistent indicators, so the use of WGI indicators is considered justified. Based on these data Kaufmann, Kraay and Zoido-Lobaton (1999) have provided evidence that the institutions have a strong and important role in economic growth. The two mentioned indicators are particularly singled out because of the assumption of the importance of their impact on economic growth and growth in exports. The last single indicator used in this model is the Transparency International Corruption Perceptions Index. This index represents perception, which means that it reflects the subjective views about the level of corruption, and this is one of the biggest constraints. In fact, there is currently no way in which the corruption in any country can be measured or calculated, so it can only be based on an assessment or perception. Corruption perceptions indicators reflect the quality of the institutions, the effectiveness of the judiciary and obstacles to investment. The most widely used indicator is the Transparency International Corruption Perception Index (Arndt, Oman, 2006). Since the Transparency International Corruption Perceptions Index is the indicator of development of institutions that attracts the greatest media attention and because it is largely used by investors, donors, business institutions and scientists, it is justified to use it in this model. The index consists of the results of research on the perception of corruption carried out by domestic and foreign business people in every country. Those researches are carried out by over ten independent organizations according to the methodology that is the same for all countries and therefore the data, with the restriction that it is a perception after all, can be considered comparable. Sources and descriptions of the dependent and independent variables are presented in Table 1.

Table 1. Variables in the analysis

DEPENDENT VARIABLES		
Variable name and label	Variable definition	Data source
GDP/pc (gdppc)	Gross domestic product per capita	World Bank data base
Exports/GDP (udz,gdp)	Share of exports in percentage of GDP	World Bank data base
INDEPENDENT VARIABLES		
Variable name and label	Variable definition	Data Source
Heritage overall index of economic freedom (heritage) (+)	Composite index consisting of ten individual indexes measuring the level of institutional development across countries.	Heritage Overall Index of Economic Freedom Heritage Foundation
WGI government effectiveness indicator (WGIuv) (+)	Reflects the perceptions of quality of public services , the quality of civil society and the degree of its independence from political pressures, the quality of policy formulation and its implementation, and the credibility of the government in the implementation of such policies .	World Bank data base
WGI rule of law indicator (WGIprav) (+)	It shows confidence in police, compliance with the rules, contract enforcement, protection of property. It's values are from -2,5 to +2,5	World Bank data base
Corruption perception index (tpIPK) (+)	Perception of the level of corruption in the country. Index can have values from 0,0 to 10,0. Higher value means less corruption in the country.	Transparency International Corruption Perception Indeks

Index of institutional reforms in transition countries (iTR)(+)	Composite index consisting average of six individual indexes with the values from 1 to 4+.	EBRD
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Source: Authors

Table 2 shows a summary of selected data. A considerable heterogeneity can be noticed with respect to the average and to the standard deviation. However, it cannot be concluded from the data whether those are deviations within countries with regard to timing, or whether it is the case of discrepancies between countries. In any case, the existence of such a variation is a good prerequisite for econometric analysis. It is because especially in the context of the analysis of temporal dimensions, greater variations also allow greater accuracy in assessing the impact of the independent variables.

Table 2. Summary of selected data

Variable	Number of observations	Average	Standard deviation	Minimum	Maximum
GDP/pc (log)	187	9,05	0,63	7,31	10,27
Exports/GDP (heritage) (+)	182	54,13	16,93	21,00	93,00
(WGIprav) (+)	187	62,48	7,44	45,70	78,00
(WGIuv) (+)	187	0,48	0,43	-0,52	1,22
(tpIPK) (+)	169	4,57	0,98	2,60	6,70
(iTR)(+)	177	3,68	0,26	2,61	4,06

Source: Authors' calculation

4. METHODOLOGY AND RESULTS

In this part of the paper, the testing of the impact of institutions on economic growth and on increase of share of exports in GDP in transition countries is carried out. After that, the attention is paid to reflections of the research on the institutional system in the Republic of Croatia.

4.1. Correlation analysis

Given the characteristics of the selected variables that are made by the two composite indexes, before the panel regression analysis it is useful to show the results of correlation analysis. In fact, with this sample data, there is a very high probability of correlation of regressors in the model, which undermines the basic assumptions of regression models on the independence of regressors.

Table 3. Correlation matrix

	Exports/ GDP	GDP/p c (log)	(heritage) (+)	(WGIuv) (+)	(WGIprav) (+)	(tpIPK) (+)	(iTR) (+)
Exports/GDP	1						
GDP/pc (log)	0,4253	1					
(heritage) (+)	0,5476	0,4943	1				
(WGIuv) (+)	0,4845	0,7698	0,5711	1			
(WGIprav) (+)	0,4705	0,6694	0,6275	0,8818	1		
(tpIPK) (+)	0,5082	0,6295	0,5689	0,7205	0,8087	1	
(iTR)(+)	0,5216	0,6227	0,7388	0,641	0,5524	0,4827	1

Source: Authors' calculation

Within the correlation analysis, it can be seen that all of the variables used in the model are correlated with each other and that with a positive sign, which is certainly an expected result, considering the theoretical and empirical assumptions. However, correlation analysis is useful for two reasons. First of all, the relationship between dependent variables shows that they are interconnected, but the size of the correlation coefficient

differs significantly from the value of 1, which indicates de facto identical variable. This value of coefficient suggests the pool of countries that are characterized by heterogeneous structure of economic growth. In this sense, it is reasonable to separately observe a variable GDP per capita, which shows the level of development, and a variable share of exports in GDP, which refers to the competitiveness of a country with respect to the export power as the most important indicator of competitiveness. It is particularly important to separate these variables due to the fact that many countries in transition in the initial period, due to low development, as well as substantial inflow of capital, had a phase of rapid economic growth. The problem is that economic growth was not based on growth of manufacturing capabilities and on the increase of competitiveness, but was based on the portfolio investment and borrowing money, which, at a later stage presented obstacles to growth and led to capital outflows. Such a situation precisely characterizes the Republic of Croatia. The second segment of the correlation analysis refers to the independent variables used in the model. Since there are two composite indicators and the three variables that are indirectly included in the composite indexes, but also probably correlated with each other, it is important to determine the extent of such a correlation because of the previously mentioned assumptions of regression analysis, which can lead to the wrong conclusions. For example, we can see a very high correlation coefficient value of the rule of law and government efficiency index, which is 0,88. Very similar is the connection of the rule of law and corruption perception index. On the other hand, it is interesting that the composite indexes Heritage Institute and the EBRD do not show such a high dependency, which means that their structure covers somewhat different segments. Correlation analysis showed positive dependence of variables of institutional environment with the relevant dependent variables. The panel regression analysis of the same variables is conducted below.

4.2. The panel analysis

Panel analysis is a method recommended for economic research in which a long temporal or spatial dimension cannot be provided, as is the case with the transition countries. Panel analysis takes more observations of time section of different units of observation, which

enables the analysis even with a smaller range of time series data, and is therefore suitable for setting up this model. The most commonly used methods of panel regression analysis, when it comes to data samples with small temporal and spatial dimension, are the method of fixed and random effects.

The general shape of the panel regression model used in this paper is:

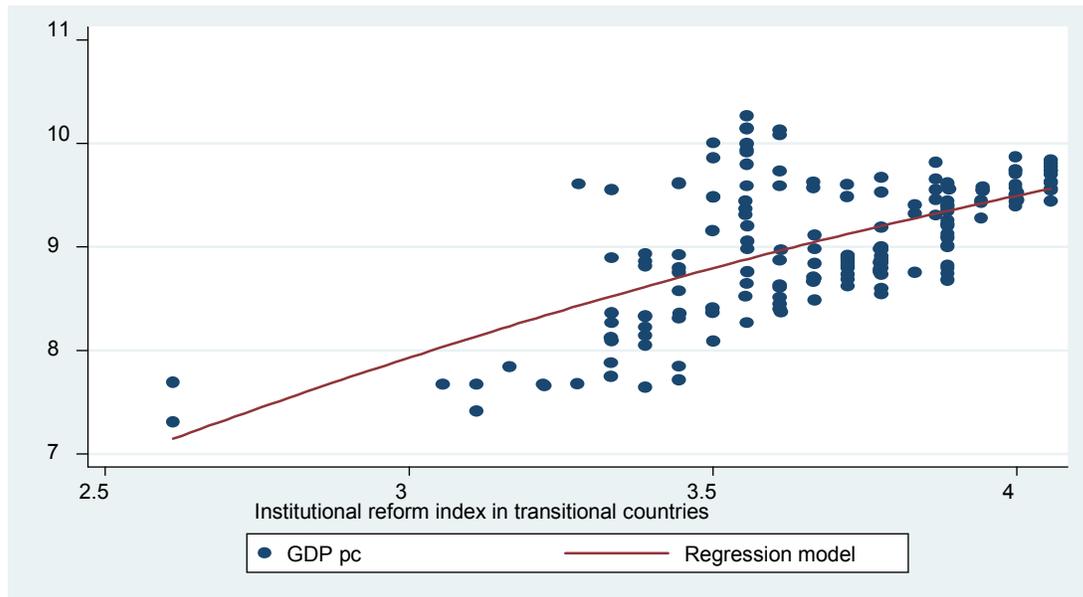
$$y_{it} = x_{it}\beta + \alpha_i + u_{it} \quad t = 1, \dots, T \quad i = 1, \dots, N$$

Where y_{it} is the dependent variable (GDP per capita or the share of exports in GDP) in the country i and time t , x_{it} is the matrix of independent variables, α_i signifies specific factors for each country, and u_{it} is residual value. In case where α_i is correlated with regressors, model of fixed effects is more appropriate, and if the distribution of α_i is corresponding to the normal distribution, the better evaluator is the method of random effects. The usual method of checking the suitability of the model of fixed and random effects is the Hausman test, which is applied in this paper.

Results of the model are shown in Table 4. When it comes to the impact of independent variables on the growth of GDP per capita, we can see a positive value of coefficient of Heritage index, of corruption perception index and of the index of institutional reforms in transition countries. Similar values are obtained using both the method of the fixed and random effects. Also in both cases, the percentage of explanation of the dependent variable is at a high level. It is important to notice that, for the movement of dependent variables, the EBRD composite index is particularly important.

The chart 1 shows the relationship between the composite index and GDP per capita (in the context of the time dimension data). Time component of panel data was evaluated with square regression equation and it is evident that the countries which have been improving the index of institutional reforms through years recorded higher growth rates of GDP per capita.

Chart 1. Square regression equation



Source: Authors' calculation

As already mentioned, correlation analysis showed that one should not expect analogous influence of independent variables on the movements of two selected dependent variables. Thus, for the growth of ratio of exports and GDP, only the index of institutional reforms in transition countries is significant. It is interesting that a positive impact on economic growth has the variable perception of corruption and the composite index of the Heritage Institute (however, to a lesser degree). Such a state is surprising, however it should be noted that the Heritage composite index is still at much higher general level both in terms of structure and geographical scope. EBRD index applies only to transition countries, which certainly reflects the common initial setting of transitional societies.

Table 4. Panel regression analysis – fixed and random effects

Independent variables	Dependent variable Ln(GDP per capita) (159 observations)		Dependent variable Share of exports in GDP (159 observations)	
	Fixed effects	Random effects	Fixed effects	Random effects

Constant	0,56 (1,04)	1,60*** (2,71)	-44.97** (-2.17)	-40.94** (-2.00)
(heritage) (+)	0,02*** (2,86)	0,01* (1,78)	0.18 (0.79)	0.21 (0.93)
(WGIuv) (+)	-0,27 (-1,61)	0,00 (0,01)	-7.91 (-1.26)	-5.49 (-0.91)
(WGIprav) (+)	0,49 (2,67)	0,29 (1,49)	-5.84 (-0.85)	-3.55 (-0.53)
(tpIPK) (+)	0,14*** (3,06)	0,15*** (2,93)	1.91 (1.07)	1.97 (1.12)
(iTR)(+)	1,81*** (9,14)	1,59*** (7,60)	23.25*** (3.11)	21.14*** (2.91)
R²	0,78	0,49	0.17	0.31
F-test/ Wald chi2	98,84***	349,04***	5.56***	30.34***
Hausman test	The model does not meet asymptotic assumptions of Hausman test		10,41*	

Source: Authors' calculation

Hausman test favors the model of fixed effects; however, there is no significant difference in values of the coefficients of variables and in their statistical significance in both models. Although the results of the empirical analysis indicate a positive interdependence of institutional variables on the growth of GDP per capita and the share of exports in GDP, the characteristics of the data sets suggest caution. First of all, it is a relatively short panel. Furthermore, the results of the Hausman test warn that the fixed effects model is more appropriate, but in the first case the test results are not valid, and in the second case the level of significance is the relatively low level. Preference for fixed effects models in this set of data should be taken with caution, since the fixed effects model is focused on the time dimension data. If the variation data in time is small, as is the case with variables of institutional environment, fixed effects model is not precise enough, because it only uses the time dimension data. On the other hand, it is unlikely that distribution α_i is not correlated with the independent variables, especially when it comes to the transition countries that have relatively similar history of the development of

the institutional environment. Finally, an additional problem is the possibility of autocorrelation, especially with the dependent variable, which leads to a problem that both in the fixed effects model and in the random effects model, the influence of independent variables on the dependent variable was assessed imprecisely. Such an endogeneity of the dependent variable is very likely in this case.

4.3. Arellano-Bond dynamic panel analysis

In this paper the Arellano-Bond dynamic analysis based on lagging of the dependent variable to eliminate autocorrelation out of the model and on use of instrumental variables (lagged independent variables) as regressors of independent variables was also conducted. Since the application of Arellano-Bond analysis is questionable in case of significant autoregression in variables, the Arellano and Bover (1995), Blundell and Bond (1998) method was also applied as more consistent and a method which assumes the absence of autoregression.

There are several reasons why the above method is suitable for such a set of data and assumptions of economic theory built into the empirical model (Arellano, Bond, 1991, 277-297):

- Within the established model of empirical research, there is a high likelihood of endogeneity of dependent and independent variables. Namely, the growth of GDP and the share of exports in GDP could lead to greater institutional change through greater financial investment in institutions or through greater openness in economic systems. Therefore, the causality can have effects in both directions; within the two-stage regression procedure the potential correlation between the dependent and independent variables is lost;

- Characteristics of individual countries that are not related to the impact of institutional reforms in time but are related to geographic, demographic and other characteristics can be correlated with the independent variables and affect the validity and accuracy of econometric research; this problem within the framework of this method is solved by

differencing variables of model which eliminates the features that are not related to the time component of the panel data; therefore it also removes the risk of correlation between the independent variables;

□ There is a big possibility of autoregression behavior of the dependent variable, namely GDP per capita and the share of exports in GDP; for example, GDP growth for the year also affects the growth of GDP the following year; if it does not grant such a feature of the dependent variable by defining lagged values of the dependent variable as regressor, evaluation of independent variables will not be accurate (the effect of regressors will be overemphasized because it will contain the effect of GDP last year, which undermines the fundamental assumptions of the least squares method);

□ It is a panel with a short time series; in this case, the data set that includes 17 years ($T = 17$). This is why the lagging of dependent variable is recommended because the autoregressive effect in the panel with a short time series is significant. Where the temporal dimension is longer, autoregressive effect of the dependent variable with time is lost and the use lagging is not so important.

Given the relatively short temporal dimension, too big a lagging of variables is not recommended because a large number of data sets is lost. In this case, the dependent and independent variables are differentiated by one year. The lagging of dependent variable for two years was also tested, but the resulting value of the coefficient and level of significance indicate that autocorrelation was already lost with the first differencing.

The general model of such autoregressive model ρ in y_{it} with $y_{i,t-1} + \dots + y_{i,t-\rho}$ as regressors, as well as regressors x_{it} is represented by the following equation:

$$y_{it} = \gamma_1 y_{i,t-1} + \dots + \gamma_\rho y_{i,t-\rho} + x_{it}'\beta + \alpha_i + \varepsilon_{it}, t = \rho + 1, \dots, T$$

Table 5 shows the results of the application of the said empirical method.

First of all, it can be seen that in both tested empirical models the autoregression of dependent variables is presented, which certainly indicates the need for the application of

this method and its advantage over the previously presented results of panel model of fixed and random effects. It can also be noted that there are no significant differences in the application of Arellano-Bond and Arellano and Bover / Blundell Bond system dynamic analysis. In both cases, the high and significant value of coefficient of variables of indexes of institutional reforms in transition countries is confirmed. In the first model, the variable efficiency of government was shown as substantial and significant, however, what surprises is a high and a significant negative impact of the rule of law. However, careful examination of the correlation matrix in table 3 shows very big coincidence of variables of government effectiveness and rule of law and therefore it can be assumed that the cause of this unusual movement of coefficient though is multicollinearity. These developments are not surprising given the nature and characteristics of the indexes of institutional environment, which are most often correlated indirectly, and often directly. Additional justification for such index movement can be in changing the perception towards the rule of law that more developed society has, a society which is potentially more sensitive on the content of indicator of the rule of law and is biased in the evaluation (more likely to give a negative assessment). On the other hand, it is possible that the perception of the effectiveness of government is related to the improvement of economic conditions and growth in exports so the causality here has a positive direction. Within the analysis of the share of exports in GDP, as in the case of analysis within the model of fixed and random samples, positive and statistically significant value of coefficient of the EBRD's composite index is shown.

Table 5. Panel regression analysis – Arellano-Bond, Arellano Bover / Blundell Bond dynamic panel analysis

	Dependent variable Ln(GDP per capita) (146 observations, 113 instruments)		Dependent variable Share of exports in GDP (141 observations, 108 instruments)	
	Arrelano- Bond	Arrelano Bover/ Blundell Bond	Arrelano- Bond	Arrelano Bover/ Blundell Bond
Constant	-0.03	0.09	-37.86*	-36.80

	(-0.08)	(0.32)	(-2.02)	(-2.46)
Lagged DV	0.81*** (20.15)	0.79*** (25.26)	0.65*** (8.11)	0.81*** (12.95)
(heritage) (+)	0.01 (1.48)	0.01*** (4.08)	-0.39 (-1.92)	-0.31 (-1.60)
(WGIuv) (+)	0.27*** (2.92)	0.34*** (4.64)	-6.87 (-1.30)	-5.46 (-1.18)
(WGIprav) (+)	-0.39*** (-2.60)	-0.38*** (-3.79)	2.97 (0.47)	5.63 (0.99)
(tpIPK) (+)	-0.01 (-0.15)	-0.01 (-0.11)	1.08 (0.66)	0.08 (0.05)
(iTR)(+)	0.39*** (3.09)	0.29*** (2.63)	21.60*** (3.12)	18.26*** (3.43)
Wald chi2	2425.61***	4405.33***	110.65***	321.18***
Hausman test	The model does not meet asymptotic assumptions of Hausman test		The model does not meet asymptotic assumptions of Hausman test	

Source: Authors' calculation

Considering that previously conducted analysis pointed out the differences in the importance of institutional variables on economic growth and on the share of exports in growth, and in particular stressed the importance of the EBRD's composite index, it is important to determine which are those institutional factors within the same composite index that are especially important for the assessment of the importance of institutional environment.

4.4. Analysis of institutional factors

Table 6 shows the correlation matrix of decomposed index of institutional reforms in transition countries. While one can see the positive interplay between all indexes, the height of the correlation coefficient is significantly lower than the correlation matrix of the general indexes shown in table 3. These values show the heterogeneity of the above

categories, which provides the quality of the data set and allows a better empirical analysis.

Table 6. Correlation matrix

	Exports/ GDP	GDP/ pc (log)	privat. of big enterpr .	privatiz. of SME's	Gover. quality and enterpr. restruct.	price liberaliz.	Trade and intern. exch.	compe titiven ess
Exports/ GDP	1							
GDP/pc (log)	0.43	1						
Privatizati on of big enterprises	0.55	0.28	1					
Privatizati on of SME's	0.33	0.69	0.30	1				
Governm.q uality and enterprise restructur.	0.53	0.69	0.53	0.68	1			
price liberalizati on	0.12	0.07	0.65	0.15	0.35	1		
Trade and intern. exchange	0.13	0.42	0.34	0.36	0.32	0.28	1	
competitiv eness	0.46	0.61	0.63	0.46	0.75	0.45	0.52	1

Source: Authors' calculation

Since the previous empirical analysis indicated the advantage of using the dynamic panel regression analysis, largely because of the presence of the first order auto-regression in the context of the dependent variables, the regression model panel of fixed and random effects was not specifically examined. Table 7 shows the results of empirical analysis.

Apart from the autocorrelation of the dependent variables, it can be seen that for the growth of GDP per capita the index of the privatization of large systems, quality of

government, corporate restructuring, and price liberalization are important. On the other hand, for the growth of exports in GDP privatization of small and medium-sized enterprises and the level of competitiveness are significant.

Table 7. Panel regression analysis – Arellano Bond dynamic panel analysis

	Dependent variable Ln(GDP per capita) (154 observations, 112 instruments)		Dependent variable Share of exports in GDP (149 observations, 107 instruments)	
	Arellano-Bond	Arellano-Bond (sys)	Arellano-Bond	Arellano-Bond (sys)
Constant	0.21 (0.35)		-6.04 (-0.19)	7.61 (0.23)
Lagged DV	0.72*** (16.78)	0.78*** (22.61)	0.56*** (6.40)	0.71*** (11.03)
privatization of big enterprises	0.25*** (3.69)	0.30*** (5.10)	0.15 (0.05)	2.28 (0.81)
privatization of SME's	-0.13 (-1.28)	-0.04 (-0.47)	11.54* (1.88)	15.91*** (3.44)
government quality and enterprise restructur.	0.27*** (3.84)	0.25*** (4.11)	-1.17 (-0.34)	-0.91 (-0.29)
price liberalization	0.35*** (2.34)	0.09 (0.77)	-3.09 (-0.37)	-8.92 (-1.10)
trade and international exchange	-0.07 (-0.51)	0.05 (0.45)	-4.43 (-0.64)	-9.41 (-1.41)
competitiveness	-0.01 (-0.01)	-0.08 (-1.88)	6.10*** (2.64)	5.169342** (2.59)
Wald chi2	3202.39***	5005.76***	129.11***	382.80***

Hausman test	The model does not meet asymptotic assumptions of Hausman test	6.97
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Source: Authors' calculation

In any case, it appears that only the coefficient of index of trade and foreign trade has no positive effect. On the contrary, its value is negative, but not statistically significant. It can also be noted that there are no significant differences in the application of Arellano-Bond and Arrelano Bover / Blundell Bond system dynamic analysis, except with the impact of price liberalization on the growth of GDP, where the coefficient in the system approach is not significant and is remarkably lower.

Since previously performed econometric analysis showed the importance of institutional variables on economic growth and export growth, it is important to compare the movements of these variables in Croatia and neighbouring countries (table 8). It may be noted that Croatia in 1996 was on the average of countries, while in 2012 the majority of indexes that appear to be important for economic growth and exports fell below the average. These trends are troubling and point to possible institutional factors that determine the long-term recession of the Croatian economy. We can certainly conclude that the transition economies, compared with Croatia, in the context of the quality of the institutional framework, on average have advanced significantly more than Croatia.

Table 8. Value comparison of institutional reforms index in transition countries

	Republic of Croatia			Average of chosen countries		
	1996	2012	Difference	1996	2012	Difference
Privatization of big enterprises	3	3,33	0,33	3,0	3,75	0,71
Privatization of SME's	4,33	4,33	0	3,9	4,04	0,17
Government quality and enterprise restructuring	2,67	3,33	0,66	2,7	3,42	0,71
Price liberalization	4	4	0	3,9	4,29	0,37
Trade and international exchange	4	4,33	0,33	4,0	4,16	0,16
Concurrency	2	3	1	2,1	3,46	1,38

Source: Authors' calculation

It is also evident that precisely in the segment of privatization of large systems, quality of government and enterprise restructuring, as well as price liberalization as variables in context of panel regression method (table 7), which showed a positive and statistically significant impact on economic growth, Croatia recorded a lag compared to transition countries. An identical situation can be observed in the analysis of the impacts of these EBRD indicators of the movement of the share of exports in GDP. Specifically, in table 7 we can see a positive and statistically significant impact of variable of privatization of small and medium-sized businesses and variable of competitiveness, and precisely in these indicators Croatia again recorded a lag in relation to the transition economies in the period from 1996 to 2012.

To gain further insight into the specifics of the process of institutional development in the Republic of Croatia, on the basis of panel data, a simple regression method of least squares was conducted. In this regression method the dependent variables (GDP per capita and the share of exports in GDP) were regressed with each independent variable.

In this way it is possible to gain insight into the dynamics of movement of institutional variables in Croatia. Table 9 shows the results of regression equations. Below is a coefficient of direction and R2, which shows the degree of explanation of the dependent variable with regression coefficient.

Table 9. Impact of institutional variable on GDP pc and share of exports in GDP in Croatia

	Dependent variable Ln(GDP per capita) (17 observ.)	Dependent variable Share of exports in GDP (17 observ.)
(heritage) (+)	0.06*** (3.36) R ² =0,43	0.27 (1.29) R ² =0,10
(WGIuv) (+)	1.39*** (5.82) R ² =0,69	8.72** (2.72) R ² =0,33
(WGIprav) (+)	1.14***	8.17**

	(3.65) R ² =0,47	(2.50) R ² =0,29
(tpIPK) (+)	0.46** (2.75) R ² =0,39	1.33 (0.86) R ² =0,06
(iTR)(+)	2.55*** (8.18) R ² =0,82	9.73 (1.59) R ² =0,14

Source: Authors' calculation

Based on the results of regression equations, in the framework of the table 9, it can be concluded that the growth of GDP per capita was followed by the improvement of institutional variables. Such a movement has the highest interdependence within the variable of EBRD institutional reforms, the efficiency of government indicator and the rule of law. On the other hand, a share of exports in GDP variable shows a somewhat different interdependence versus institutional variables. Specifically, in relation to the impact on growth of GDP per capita, where all variables showed a positive and statistically significant impact, with variable share of exports in GDP such dependence is confirmed only in the case of indicators of the effectiveness of government and the rule of law.

5. Conclusion

Based on the econometric analysis, the hypothesis that there is a positive correlation link between institutional development and economic growth is confirmed. A higher level of institutional development is associated with higher levels of GDP per capita.

Due to a lack of relevant data, the analysis for transition countries was conducted for the period from 1996 to 2012, which actually represents a relatively short period of time, and therefore one of the conclusions that arises is that countries can benefit by implementing institutional changes even in the short term. This conclusion has very important implications for Croatia and for determination of further direction of its development, as

the current model of growth appears difficult to sustain. From the experience of the selected transition countries, and based on existing indicators of development institutions in Croatia, one could guess what the future trends of GDP would be. However, there is the question of justification of observing all selected transition countries as economic and institutional entity, knowing how much diversity and specificity among observed countries exists, as well as the question of relevance of the findings obtained by such analysis.

Therefore, the second hypothesis, that the development of informal institutions is a long-term process and that their change takes years, was also tested. Transition countries represent a group of countries with very similar initial conditions and they are an extremely important group for the study of the impact of institutional reforms on the development. Their example can show that institutional changes have significant economic impact. However, such a starting point does not preclude the view that each country must develop their own ways of implementing institutional changes because, due to the specificity of each country, simply copying and implementing the model might be unsuccessful and ineffective. Confirmation of this hypothesis has a significant importance because before any attempt of application of another's institutional framework, a good care of informal institutions and the conditions prevailing in each country should be taken. Considering institutional changes in Croatia, it is necessary to bear this knowledge in mind. Countries that have shared a common history of the socialist countries do not have the same informal institutions such as, for instance, the countries that share European common history.

Analysis of the institutional framework in the Republic of Croatia has shown certainly a positive impact of the quality of institutions on the GDP growth. This finding was confirmed by numerous studies, some of which were already listed in this paper. It has been shown also that the existence of the GDP growth of some country, which is larger than that derived from the quality of its institutions, warns of its possible unsustainability. At the end of the 1990s such a situation was noted in South America. Even in countries with good institutions, the lack of continuous improvement could reduce long-term growth rates. A comparison with the transition economies shows that Croatia potentially belongs to such a group of countries. Specifically, as shown, Croatia had an average level

of institutional quality in a set of transition countries. However, because the process of improving the quality of institutions in Croatia was much slower, in time the difference in level of institutional quality has increased in favor of the transition countries. Such developments were also recorded with GDP growth in Croatia, which at first was at above-average levels but in recent years Croatia is at the rear. Therefore, Croatia needs to change the model of economic growth and reorient from the consumption generated growth to the growth that will be based on the production and export. Croatia had a relatively high gross domestic product per capita in relation to the quality of institutions and knowledge about this is additionally gaining in importance. Results of the analysis have directly indicated that institutional factors have different effects on the growth of GDP and the share of exports in GDP. While for the GDP growth almost all institutional factors are significant, for the increase in the share of exports in GDP the general level of competitiveness, efficiency of government and the rule of law appear as the most important.

These findings just prove the settings of the third hypothesis, that the economic results of Croatia are affected by the institutions that are directly related to the height of transaction costs. This statement has been proven both by empirical analysis of transition countries and by regression equations relating to the time series of variables of institutional environment, the level of Croatian GDP per capita and the share of exports in Croatian GDP. Conducted empirical methods were aimed to check out how the institutions that directly reduce transaction costs, respectively the rule of law and the absence of corruption, affect the investment activity in the real sector. Since Croatia has attracted significant amounts of foreign direct investment which had no development role, data on their amount were not taken into account. For this reason, the share of exports in GDP has been chosen as the variable. Croatia needs greenfield investments in the manufacturing and export sector, regardless of whether they are foreign or domestic, it needs the investments that will ultimately result in spill-over effects and in increased levels of employment.

It has been shown that increased levels of the rule of law and of the efficiency of government would contribute to the increase in exports. This model aims to point out that the improvement of rule of law institution creates preconditions for safer investing and

more efficient capital and resource allocation. Improving the rule of law would reduce the transaction costs, which would have a positive effect on attracting domestic and foreign investment in the manufacturing and export sector, so in this regard it is essential to pay due attention to the development of the rule of law institution. The goal is to stimulate discussion of the importance of institutional changes and highlight the importance of institutional development in Croatia. Favorable institutions would contribute to greater security of capital which would have further effects on investment. If the capital is to be tied up in long-term investments, it is necessary to have security and guarantee of property rights. Rentier behavior of the political elite and particularly system corruption deter any capital except speculative capital and the capital of dubious origin. This further leads to suboptimal allocation of resources. The development of institutions reduces the opportunities for such behavior, and therefore the institutional change appears as a prerequisite of better economic performance of any country including Croatia. Institutional changes would lead to changes in behavior patterns of political elites in Croatia, because in the situation where the rule of law is present, opportunities for rent-seeking behavior would be very limited.

It is certain that the institutional change in Croatia will contribute to future economic growth. The selection of a path of institutional change is another issue which has not yet been discussed in Croatia, apart from general talk or apart from the context of accepting European values. One gets the impression that among the political elites in Croatia the prevailing opinion is that there is a pattern of effective European institutions which should only be adopted and applied.

This is primarily applied to legal arrangements, the adoption of which is not a problem for the political elite, because among them there is a consensus on that. But such an approach is wrong and will not be sufficient. Croatia needs to develop its own way of institutional change, using the cumulated knowledge and all the possibilities of the existing institutional framework, including both formal and informal institutions. The choice of the path of institutional change is one of the most important determinants of its success, and it should not be taken lightly.

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