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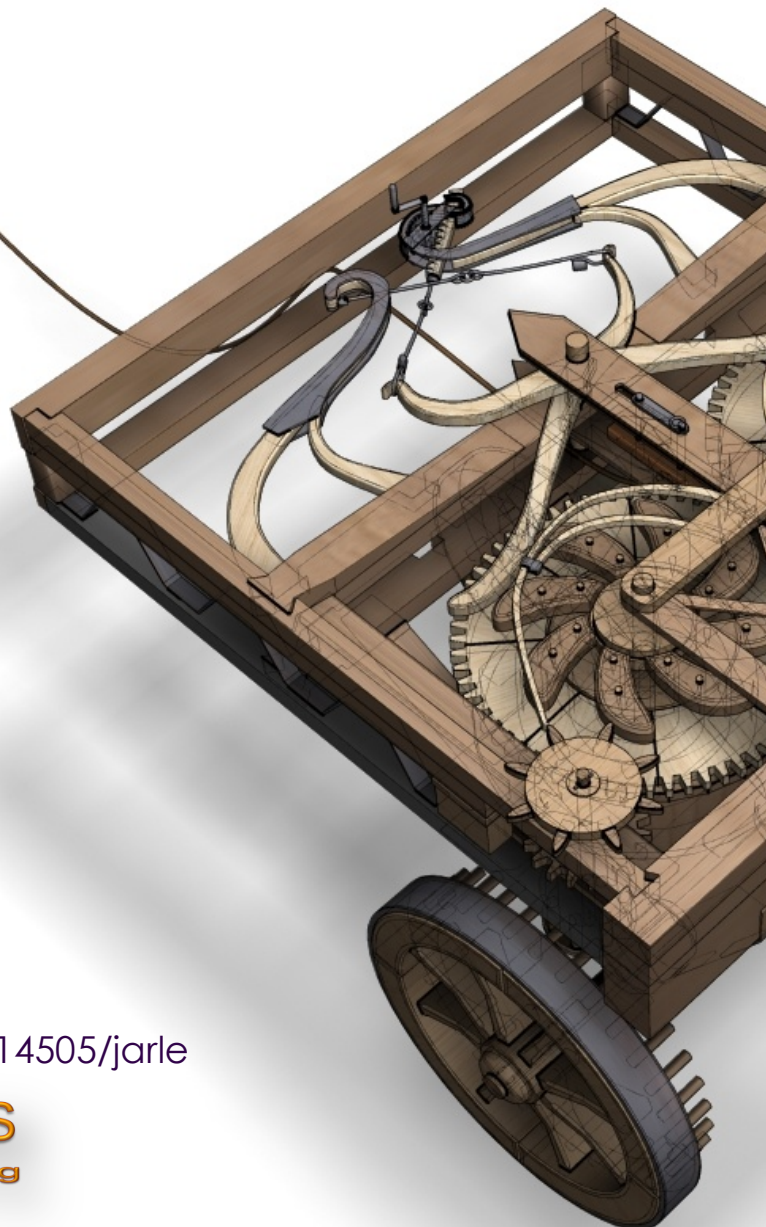
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Assessment of the Level of Constitutionalism in Transition Economies

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Abstract:

This work proposes a methodology for a comparative analysis of the level of constitutionalism and a methodology based on it for constitutional diagnosis and monitoring. This technique is particularly useful for studying the level of constitutionalism in transition countries. It has succeeded in classifying countries by level of constitutionalism and determining their cluster-forming factors.

Keywords: transition countries; constitutional economy; constitutionalism; cluster analysis; factor analysis; discrete analysis.

JEL Classification: E17; P20.

Introduction

The key tasks of systemic constitutional monitoring are to propose adequate methodological solutions. In view of the different approaches available in international practice, the authors offer new solutions to the problems. This will provide an opportunity not only to solve the problem of constitutional diagnosis, but also to manage the process of overcoming the constitutional deficit in the country.

The researches of the new institutional school economists have demonstrated the importance of the impact of the effective functioning of institutions on economic growth. The most important formal institution in most countries is the Constitution. However, the impact of the Constitution on the economic and social development of society is not limited to the adoption of a written document, but is much more multilateral and deeper. That's exactly what evolved the constitutional economy as a new branch of the institutionalism paradigm. The constitutional economy has become one of the most growing areas of the economy in recent decades.

The study of T. Persson and G. Tabellini (2003) made the greatest contribution to the development of a positive constitutional economy. The main result of their research was the realization that the constitutional rules, in particular the forms of government (parliamentary or presidential) and the rules of the electoral process have an important impact on the level of government expenditure of the countries studied. Previously, R. Hall and C.I. Jones (1999) had shown that the constitutional rules played a significant role in the development of economic institutions and largely predetermined the social infrastructure of countries. In recent years, many studies, that have reviewed the impact of constitutional rules on the economic development of countries, have been conducted. In particular, the influence of the electoral rules was considered in the works of D. Austen-Smith

(2000), A. Lizzeri and N. Persico (2001), the influence of vertical separation of powers or forms of federal Government was considered in the work of L. Blume and S. Voigt (2008), the effect of the basic rights was considered in the work of D. Farber (2002). A sufficiently detailed and in-depth review of the research on the positive constitutional economy over the last decade and its prospects for development can be found in the work of S. Voigt (2011).

Another important area (within the research on the constitutional economy) is the classification and comparative analysis of countries in terms of the level of balance and compliance with constitutional norms. The level of compliance with constitutional rules predetermines the nature and contents of the economic and social development society institutions. Later in this article, we will refer to the term 'level of constitutionalism'.

It's quite difficult to determine the level of the constitutionalism, as it is necessary to define the measured indicators by which countries are classified. For the first time, the task of classifying countries by level constitutionalism was considered in book of H. Arutiunian and A. Mavchich (1999), where they have introduced the concept of integral level constitutionalism. The importance of such research is that they can be closely linked to the very practical problem of constitutional monitoring and constitutional diagnosis. These concepts are very precisely defined in the work of H. Arutiunian (2016b): 'Constitutional monitoring' is the means and the possibility of guaranteeing the constitutional balance in the dynamics of overcoming the constitutionalism deficit and the stable and dynamic development on the basis of constitutional diagnosis. 'Constitutional diagnosis', in turn, includes the instrument and process of assessing the constitutionalism in society, disclosing the relevance of real social relations to the constitutionally enshrined values, principles and norms.

A positive constitutional economy considers the impact of constitutional rules on the economy. This approach implies some inertia, when a change in rules requires some time for adaptation and impact on economic processes. Transition countries are characterized not only by a rapid change in the economic situation, but also by frequent changes in the constitutional rules. According to the (Elkins, Ginsburg and Melton, 2014) *Comparative Constitutions project* database, between 1991 and 2013, there were 157 constitutional changes in transition economies, with 35 new constitutions and 117 amendments and additions. On this basis, the approach of a positive constitutional economy for the transition countries is proving to be ineffective, as new rule changes usually occur before the end of the adaptation period of the earlier regulations. This is why, for transition countries, classification and comparison tasks in relation to the use of monitoring and diagnostic techniques have resulted in more meaningful practical results.

This work focuses on how to conduct constitutional monitoring and diagnosis using clustering, factoring and discrete analysis. The possibility of using the cluster analysis for constitutional diagnosis has been described in the works of H. Sarhsian, R. Hevorhian and N. Kochinian (2016). The possibility of combining the methods of cluster and discrete analysis for constitutional monitoring was proposed in the work of H. Sarhasian (2016).

It was noted that, in today's context, the choice of effective economic policies depends largely on the disclosure of the constitutionalism deficit (the measure of the gap), its composition and structure, the multiplicative effects and the mechanisms for transforming its impact on the economy. The theoretical and methodological basis for the implementation of the above issues is the constitutional economy.

Subsequently, we:

- describe the data on which a comparative analysis can be based,
- describe the methodology for conducting constitutional diagnostics,
- apply the proposed methodology to the example of transition countries,
- make conclusions and recommendations for further research.

1. Data declaration

The proposed method of comparative analysis uses three sets of indicators from which the level of constitutionalism can be calculated: characteristics of the legal state, the characteristics of democratic development and socio-economic indicators. It is these groups of indicators that have been used in the literature on the constitutional economy (Harutyunyan 2011).

It was noted that, in order to determine the level of constitutionalism, it was necessary to assess the degree of compliance and implementation of constitutional norms. With the exception of the socio-economic indicators group, the factors in the other two groups are, in a sense, subjective. Regardless of whether these factors have been assessed, either through interviews or through expert assessments, such a situation results in the fact that these estimates may often be distorted by the methods used to collect and process information (and sometimes also for the reasons of policy and other authors' preferences). For the possible more objective

estimation, it is necessary to use indicators obtained from different sources using different methods. The more sources and indicators are used, the more accurate the results will be.

The multiple method of estimating the constitutionalism indicator, described in the next part of the article, allows to use a relatively large number of indicators and sources. At the same time, you should consider that the number of the indicators is limited by the size of the sample.

This part shows only the data that will be used in this article. Several sources of information, such as databases, were our reviews for research:

- World Bank World Development Indicators (World Bank Open Data).
- Freedom House for the transitional economies of Nations in Transition (2014).
- Freedom House Freedom in the World (2014).
- Quality indicators of the management of World Governance Indicators.
- Transparency International, Corruption Perception Index
- United Nations development programmes, Human Development Index.
- Heritage Foundation Index of Economic Freedom (2014).

We use data from 29 transition countries for 2014 to conduct the study. As the sample is rather small, we already at the preliminary stage select for one variable that describes a particular component of the socio-economic, democratic and institutional characteristics of countries. For example, corruption indicators can be found in more than three databases mentioned above: Freedom House, World Governance Indicators and Transparency International.

The selection of indicators is based on the following criteria: 1) Specialization of sources of information, 2) use of the largest number of sources of information to avoid biased estimates. In the example of the corruption indicator, we choose Transparency International, which is a specialized organization dealing with corruption assessment, and in addition, data of Freedom House and World Governance Indicators are used by us to evaluate other characteristics. This approach allows us to take advantage of all three sources of information, and the level of corruption is measured by means of a specialized indicator. It should be noted that at this stage it is necessary to conduct a correlative analysis and to select a variable from a set of characteristics that have high correlation coefficient values. In particular, the correlation coefficient among all three corruption indicators in the sample exceeds the 0.9. This approach ensures that, without losing information, we are reducing the number of variables being investigated, which makes it possible to conduct further research in a small sample of countries.

Here are all variables, we have chosen to conduct the research:

- Electoral Process FHNT,
- Civil Society FHNT,
- Independent Media FHNT,
- Government Effectiveness WGI,
- Political Stability No Violence WGI,
- Regulatory Quality WGI,
- Rule of Law WGI,
- Voice and Accountability WGI,
- Political Pluralism and Participation FHFV,
- Freedom of Expression and Belief FHFV,
- Associational and Organizational Rights FHFV,
- Personal Autonomy and Individual Rights FHFV,
- Corruption Perception Index TI,
- GINI index WBWDI,
- Poverty headcount ratio at national poverty lines (% of population) WBWDI,
- Property Right HI,
- Human Development Indicator UNDP.

2. Methodology of constitutional diagnosis

To determine the level of constitutionalism in this work, a multilevel approach is proposed, consisting of the following steps:

- (1) Preliminary step (described in the previous section)
- (2) Determining the integral level of constitutional sustainability;
- (3) Identify latent factors or the most important variables that characterize the level of constitutionalism. This reduces the number of explanation variables for further research;

- (4) The splitting of countries into relatively homogeneous clusters and the study of critical characteristics from that perspective;
- (5) Research within each cluster to identify the most important characteristics within clusters and the most common countries.

The conduct of a comprehensive study of the named phases, at some intervals, formulates a unified methodology for constitutional diagnosis based on a comparative analysis of countries. The methodology allows, *inter alia*, monitoring changes in the integral level of constitutional sustainability for a country, to understand the changes in the situation of countries in clusters, to determine the change in the most important indicators responsible for division countries into clusters, as well as the most important indicators within clusters.

It should be noted that this approach would be better name a comparative analysis of the level of constitutionalism, as the resulting for an individual country make sense only in comparison with other sample countries. In this sense, an adequate sample of countries is important for the application of this method. Countries with economies in transition, which have gone very similar with the constitutional reforms in recent decades, are a fairly homogeneous sample for comparative analysis. At the same time, the need for a homogeneous sample results in the fact that it is rather small. This circumstance imposes some limitations that are taken into account in the proposed approach. In particular, in the preliminary and first stages of the method, if possible, the number of explanatory variables is reduced in such a way as 'not to lose' important information. Next, in the description of the factor analysis method used in this work, we will revisit this topic.

2.1. Integral level of constitutional sustainability

In the work of H. Arutiunian (2016a) an integral measure of constitutionality was proposed as an instrument of constitutional diagnosis, calculated as follows:

$$U_i = \sum_{j=1}^m \left[\frac{(x_{ij} - x_j^{(3)})}{\sigma(x_j)} \prod_{\substack{\beta=1 \\ \beta \neq j}}^m (1 - \gamma_{\beta j}) \right] \quad (1)$$

where: the U_i is the integral level of constitutional sustainability; x_{ij} – characteristic of the j -indicator of i -country (group); $x_j^{(3)}$ – characteristic of the reference indicator (mean value, median, etc.); $\gamma_{\beta j}$ – coefficients of pair correlation; $\sigma(x_j)$ – Variation of x_j indicator.

This analysis makes sense to use only those indicators that have a reasonably high correlation level. The use of low correlation indicators results in an unreasonably high unit weight of the indicator in the integral measure. The elimination of possible distortion would necessitate the development of other instruments proposed later in the article. When calculating the integrated index for transition countries, we will use a much-correlated index to avoid biased estimates.

2.2. Factorial analysis

The purpose of the factor analysis is to reduce the number of explanatory variables with the minimum possible loss of initial information. However, the higher the correlation between the source data, the more adequate the results will be. In this article (Gorsuch 1983), we will use the main component analysis by selecting not all components, but only those that have the greatest impact on variance. To determine the most influential component, use the concept of 'Communality'.

The notion of community is very important in situations where a small sample is being investigated. In the most general case, a sufficiently large sample is needed to produce satisfactory estimates through factor analysis. In our case, the sample consists of 29 transition economies. In such cases, satisfactory results can be obtained when the average value of a community is sufficiently large (MacCallum *et al.* 2001). In our study, to get a high average community value, we first do a correlative analysis of the variables included in the study at the preliminary stage (Hogarty *et al.* 2005). Those variables that have a low correlation coefficient value with the rest of the variables are used as separate variables in further analysis.

We will use the Kaiser criterion to determine the number of factors. Only those factors whose values are greater than 1 are selected. We use the axes rotation method of the 'quartimax' to carry out a factor analysis. The resulting factor structure evaluates the factor value estimates for each object (in our case for each country), which are then used in a clustered and discrete analysis.

The method used to evaluate factor value estimates obtained from factor analysis in the cluster analysis in the literature is sometimes referred to as tandem analysis (Elder 1999). Some authors (Arabie and Hubert 1994) point to the drawbacks of this approach, in particular because of the loss of some information that would be taken into account in the direct use of the clustered analysis. However, most researches point out that the use of tandem analysis proves to be very useful and reasonable, at least from a practical point of view (Fiedler and McDonald 1993).

2.3. Clustered analysis

There are two basic methods of cluster analysis – a hierarchical method and a k-means clustering (Everitt *et al.* 2011). In this article, we will use the algorithm of the two-step method in the clustered analysis implemented in the SPSS (Chiu *et al.* 2001) package. This cluster analysis algorithm uses both basic methods. For more information about this method, see the documentation in the SPSS (The SPSS Two Step cluster component, 2001) package.

The two-step method of cluster analysis is to identify not only the best partitioning, but also to identify the most important factors that determine this optimal split, and to explore the characteristics of the split. To conduct a clustered analysis, we use the Euclidean distance.

When you combine the i and the j classes into k class, the distance between the new class k and any other h class is recalculated according to the following formula:

$$d_{hk} = \left(\frac{n_i}{n_k}\right)d_{hi} + \left(\frac{n_j}{n_k}\right)d_{hj} \quad (2)$$

where: n_i, n_j, n_k are the numbers of objects in classes i, j, k , respectively.

The distances between the other classes remain unchanged. The ratio of the average intracluster distance to the intercluster distance is taken as an assessment of the relationship:

$$\pi = \frac{a_i + a_j}{2b_{ij}} \quad (3)$$

where: a_i and a_j are the average intracluster distances of i and j classes; b_{ij} is the average intercluster distance between the same classes.

2.4. Discrete analysis

The next step in assessing the different parameters of constitutionality involves the application of discrete modeling techniques.

Discrete analysis techniques are widely used in different areas of science and technology for the classification and recognition of images (Zhuravlev 1978). We use these techniques to examine the patterns and diagnostics of constitutional development processes.

In general, it is assumed that n objects and m features that characterize these objects are sometimes said to be set to the same T matrix. The purpose of a discrete method is to define object classes without the prior statistical hypothesis of those objects. Let many homogeneous objects $E = \{e_1, e_2, \dots, e_m\}$ and many features $P = \{p_1, p_2, \dots, p_n\}$ that characterize these objects to be pre-determined. Each object is specified by a set of n features, and is characterized by a_{ij} value of j for object $i, t_{ij} \in \{0, 1, \dots, r\}$ where $r \geq 2, i = 1, 2, \dots, m, j = 1, 2, \dots, n$. Suppose that all objects in E set have some characteristics and are distinguished by the features of a P set, meaning that all the rows in the table $T = (t_{ij})$ are different.

A range of features subsets i_1, i_2, \dots, i_l forms a test if with the exception of all characters of T table, excluding listed, the rows of the newly received table are different from each other. The number l is called the test length.

The next important subject of discrete analysis is the notion of 'dead-end test'. A test is called 'dead-end test' if none of its subsets is a test. It follows from this definition that if you remove any column from the table T of the 'dead-end test', the remaining indicators (columns) will no longer be a test.

It follows from the definition that the 'dead-end test' is the result of a local-maximum compression of the original T -matrix, where it is still possible to distinguish between countries from different classes. If you later compress the T -table, this property is lost. The 'dead-end tests' are a kind of irredundant description of object-countries that are characterized by rows in the T -matrix.

It is natural to assume that if a certain topic and its corresponding column are in a large number of 'dead-end tests', it is important. This idea leads to the introduction of the concept of a measure of importance. Let k be the total number of 'dead-end tests' for table T , $k(j)$ is the number of 'dead-end tests' that have a column corresponding to the j characteristic. The value $P(j) = k(j)/k$ is referred to as the importance of the j characteristic in classifying E objects according to P characteristics. The measure thus introduced proved to be useful in a number of application tasks (Zhuravlev, Ryazanov and Senko 2006). It can also be used successfully to determine the importance of the features within the clusters for the constitutionalism level algorithm proposed in this article.

As part of the study of countries, through discrete modeling concepts such as 'diagnostic test', 'control test,' and so forth, the 'image recognition' tasks for countries are solving, inter alia, defines:

- information weight or 'importance' of indicator (assessment of power of influence on the phenomena in question);
- the information weight of the country in which the objects can be classified;
- the most common object in this class.

The cluster analysis divides countries into groups with similar characteristics and identifies those that are most important to the resulting division or, in the same way that are the main indicators of the differences between groups. The next step is to use discrete analysis to identify patterns within groups. We call this research an intracluster analysis.

Thus, by breaking countries into clusters, we receive relatively homogeneous classes of countries to which discrete analysis techniques are applied. To apply the discrete analysis method to constitutional stability issues, we calculate the average of the indicator in the cluster, and then define the deviations and ascribe the corresponding values. The same procedures are repeated for each received cluster. As a result, we get the most important features and typical countries for all clusters.

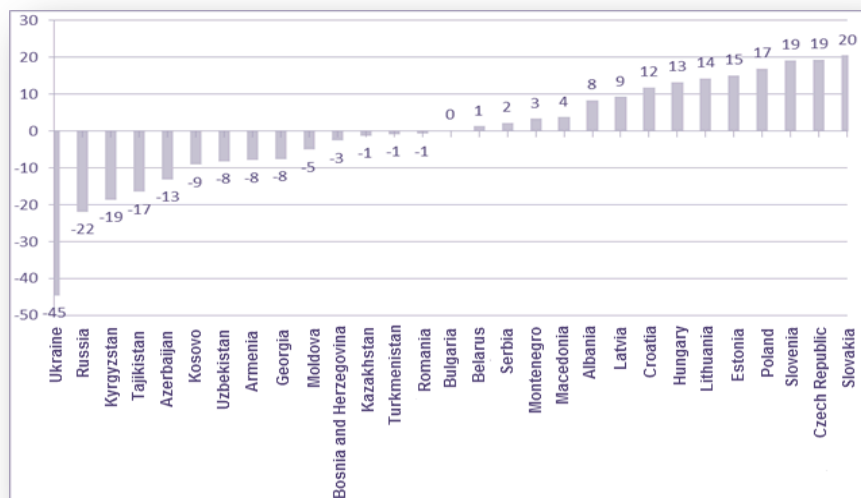
3. Determination of the level of constitutionalism in transition countries

In this paragraph, we are conducting an analysis of the level of constitutionalism for the transition countries on the basis of the methodology described in paragraph 3 using the data given in paragraph 2.

The integral level of constitutionalism is calculated by us on the basis of the state of the rule of law and democratic development. The characteristics of socio-economic indicators have low correlation values with the rest of the variables. As indicated in paragraph 3, the use of such variables in an integral-level assessment of constitutionalism results in biased estimates.

On the basis of this data we have built an integral level of constitutional stability based on formula (1). To build an index, we made small data conversions to construct the index so that the higher index values correspond to the best situation with constitutionalism. The results are shown in Figure 1.

Figure 1. The constitutional stability level index 2014



As can be seen in the illustration, the transition countries in terms of constitutional stability can be divided into three groups: countries where the indicator of constitutional sustainability is negative, countries where the indicator is close to zero and countries with a positive level of constitutional stability. The analysis shows that even a relatively homogeneous group of transition economies has quite different situations with a level of constitutionalism. From Figure 1, it can be deduced that countries can be divided into specific clusters that have fairly similar characteristics. At the same time, the index of constitutional sustainability gives only a very approximate picture of the level of constitutionalism, as it provides biased estimates when considering variables that have a low correlation with the rest of the variables. However, the index is useful for the initial presentation of the country's constitutionalism level ratio and further research.

As noted in paragraph 3, variables with a high correlation coefficient should be used to carry out factor analysis on a small sample. According to our approach, the following 4 variables have the lowest correlation factors with the other variables: The political stability indicator, the Gini coefficient, the poverty level and the human development indicator are not considered in the factor analysis, but are included in the cluster analysis directly. Other variables are analyzed using factor analysis to detect latent explanatory factors.

As a result of the factor analysis, there are 2 latent factors in the remaining 13 variables that conditionally can be called: (1) The democratic development factor, (2) the institution-building factor of countries.

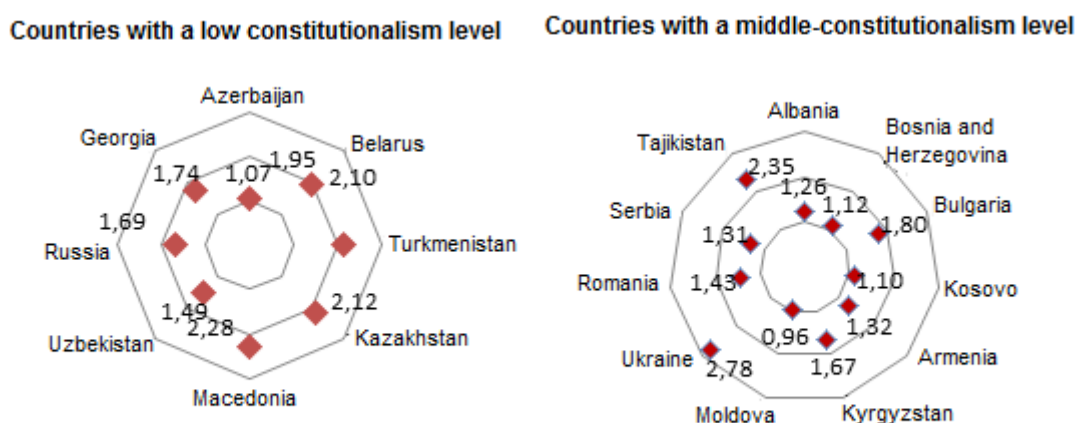
On the basis of these studies, we have selected variables that are used in cluster analysis and further in discrete analysis for intra-cluster research:

- (1) Gini coefficient,
- (2) Poverty Level,
- (3) Human Development Indicator
- (4) Political Stability Indicator
- (5) Institutional Development Factor
- (6) Democratic Development Factor

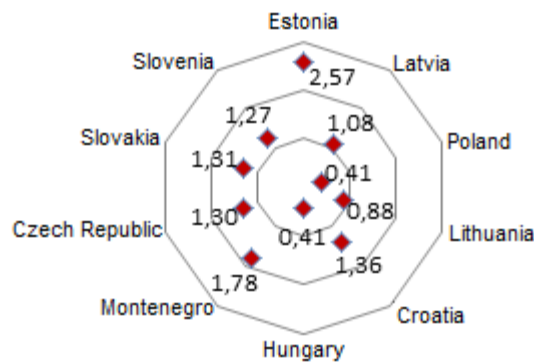
In the Data Descriptions section, we have already said that the literature identifies three groups of indicators that are used to assess the level of constitutionalism. They are characteristics of the legal state, the characteristics of democratic development and socio-economic indicators. Our analysis has shown that, apart from these three groups, the indicator of political stability must also be considered separately. Really, the remaining indicators listed above are included in one of the specified groups. The first three belong to the group of socio-economic characteristics and cannot be based on a latent factor, the 5th factor is the rule-of-law state characteristic and the sixth is the characteristic of democratic development.

The two-step method of cluster analysis identifies the optimal partitioning of countries across clusters. The analysis showed that it is best to split countries into 3 clusters. The following illustration shows these clusters together with the Euclidean distances value from the center of the cluster for each country (Figure 2).

Figure 2. Grouping countries at clusters



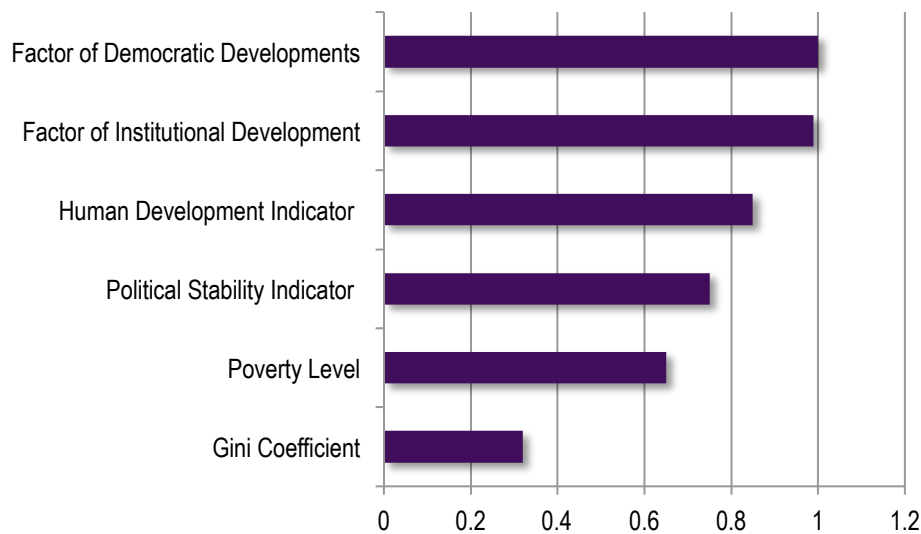
Countries with a high constitutionalism level



This table shows how useful a clustered analysis can be to monitor constitutionalism. Although the level of constitutional stability indicator, for example, is much lower in Ukraine than in Belarus, Ukraine finds itself in the second cluster, where the average level of constitutional stability is higher than in the first cluster.

Figure 4 shows the standard SPSS report on the importance of each factor in determining the optimal split. The level of importance is determined by using a standardized scale from '0' to '1', where '0' indicates the insignificance of the factor, '1' is the greatest materiality.

Figure 3. The importance of the factors used in the double-step cluster analysis method 2014.



In the context of this clustering, the factors of democratic and institutional development were most important, followed by a human capital indicator and a political stability indicator. The lowest level of importance in socio-economic indicators: Poverty level and Gini coefficient. All of these figures are, in descending order of importance, presented above.

The transition countries can be divided into three groups: Low-, medium- and high-constitutionalism countries. The cluster analysis identifies the composition of these groups and the characteristics that are most important in terms of such a separation. Within each cluster, you can identify the features that are most important for this cluster by using discrete analysis. In other words, the cluster analysis identifies the most important features on which clusters differ, and discrete analyses -identify the features that have the greatest impact on the differences between countries within clusters.

A discrete analysis showed that in low-constitutionalism countries, the following characteristics are most important (in the sense of belonging to this cluster):

- Institutional development factor;
- Political stability Indicator;

- Factor of democratic development.

In a medium-constitutionalism e cluster, the most important is

- Human Development Index

In a high-constitutionalism cluster,

- Factor of institutional development is important.

For countries in the second cluster, the indicator of human development is the most important. This means that within the second cluster, differences among countries are first of all determined by the level of human development.

A discrete analysis results that in the most typical countries in 2014 for a low-level cluster constitutionalism is Turkmenistan, for the middle-level cluster constitutionalism- Bulgaria cluster, and for countries with a high level of constitutionalism - Estonia.

Conclusion

The proposed methodology allows for constitutional diagnostics to be carried out on a multilevel basis, comparing and correlating the results obtained by different methods. It is based on comparative analysis and is applicable to cases with a relatively small sample of countries. A test of the methodology for the transitional countries revealed a number of interesting results, which are described in detail in the recently published work of the authors (Harutyunyan, Sargsyan and Gevorgyan 2017).

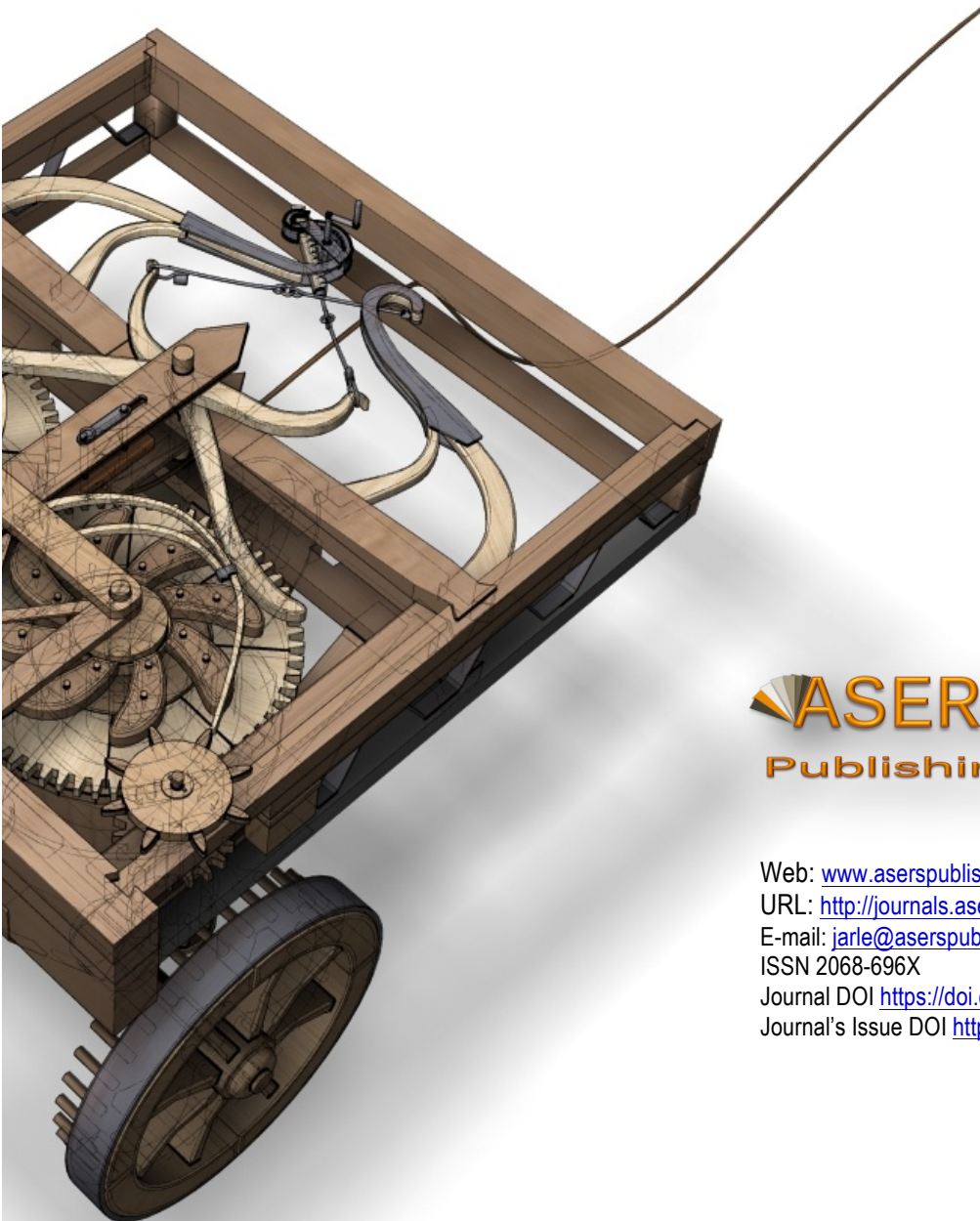
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