Abstract

In the conditions of Ukraine's integration into the European educational area, it is vital to follow the trend of democratization of the society and obtaining freedoms in various spheres of the Ukraine's development. Therefore, the concept of university autonomy is one of the key in development of the Ukrainian higher education system, whereas obtaining additional freedoms in management of the higher educational institutions enhances its competitiveness. The concept of autonomy has a dual nature, thereby impacting the need to determine such a level of autonomy that would ensure high quality of higher education in the frame of the country's national development. The article analyzes methodological approaches to calculation of autonomy of the higher education system in Ukraine. As a result, the methods of the European University, which include examination of autonomy by four components: organizational, staff, financial and academic, are chosen for the research. The development level method and the cluster analysis are selected as mathematical tools. Following the development level method, an integral indicator for each component of autonomy is obtained. On the basis of calculation, it is determined that Ukraine has a low level of autonomy across all the components. Through the use of the cluster analysis, 5 clusters of autonomy of the higher education system are built, whereupon they obtain their economic interpretation. Analysis of the Ukrainian higher education system's place in the European educational area shows that the system of the Ukrainian higher education is categorized within the cluster with a low level of autonomy.

Keywords

autonomy, higher education system, clusterization, state regulation

JEL Classification

I23, I25, C38

INTRODUCTION

Ukraine has chosen the line of integration into the European area in all the spheres of vital activity. The system of higher education as an element of the system of “educational market – labor market – consumer-oriented market” and the subsystem of the all-European system of higher education in the conditions of the global trend is gaining more and more autonomy.

Autonomy is a complex concept meaning availability of opportunities for the higher education institutions to form and implement independent policies in the areas of staff management, formation and distribution of budget, specification of academic programs for training the students and set of rules, etc.

It should be noted that autonomy has two sides, which are connected with the cognitive behavior of people within the framework of availability of freedom of actions. Thus, on the one hand, existence of freedom enables the mankind to take a more active part in the econom-
ic-environmental, social and political life of the society, thereby increasing its capabilities and ensuring achievement of the goal of every human being. Freedom in this sense is an enhancement of opportunities. On the other hand, freedom is a cut down of restrictions, operation rules of a particular system (Greiner, 1972). Within this concept, a dramatic reduction of restrictions invokes chaos or even collapse of the system, therefore such an increase of freedom turns into entropy for the society. Thus, management of the human freedom is, in the first line, a balance between great opportunities and rules of conduct (morality) of the society. In this regard, in our opinion, it is expedient to consider autonomy of the university from the position of providing the opportunity for independent managerial decision-making in the university under the conditions of existence of the moral and traditional principles of the society’s functioning in a particular state.

Subject to the aforesaid, it can be determined that autonomy of the higher education system of the state depends on the national structure of that system, which structure, in turn, is based on traditions of the society. An unlimited increase in autonomy for the states, where the higher education system has significant roots of university freedom, may open up new opportunities. At the same time, for the higher education systems that have conventionally functioned under significant state control, such an increase of autonomy might cause an inefficient functioning of the system.

1. LITERATURE REVIEW

In the context of the society’s democratization and rise of competition in the market of educational services, more attention is paid to examination of the problems of autonomy. Thus, the problems of autonomy have been recently dealt with by such scholars as Myers (1998), Van Damme (2000), Ben Jong Bloed (2010), Maasen (2000), Rhoades and Sporn (2002), El-Khawas (1998), etc.

In his paper, Ehrlich (2000) states that there is a significant relation between the society’s development and the university education. On the one hand, development of the society requires qualitative improvement of education, and, on the other hand, democratization of the society entails an increase for democratic freedoms in the educational area.

In his paper, Van Damme (2000) highlights the problem of international co-operation in the educational area. In his opinion, the contemporary development of the society and internationalization of the labor resources require a growth of autonomy of the higher education system, whereby the higher education institutions will be able to turn into international educational institutes.

A thorough research is made in the works of Jong Bloed (2004), Jongbloed, Slippersaeter, and Lepori (2006), Jongbloed (2004). Development of the higher education institutions largely depends on availability of financial resources for them, however, in the setting of increased competitiveness, it is necessary for the higher education institutions to take possession of greater rights and freedoms for their financial autonomy (Jong Bloed, 2004). Those ideas have been extended in Jongbloed, Slippersaeter, and Lepori (2006) and Jongbloed (2004), where the author emphasizes the fact that the financial autonomy of the higher education institutions is a major factor in competitiveness of the country’s higher education system.

According to Maassen, Eli Moen, and Bjørn Stensaker (2011), the state regulation of the system of higher education is an important lever for its effective development, however, one should find a balance between intensification of regulation and autonomy of the higher education system, whereas under the conditions of the market economy development, the higher education institutions become separate agents of economic relations.

Musselin (2013) in his paper shows that since the higher education institutions are traditional institutions of the society and have a great history, they tend to be autonomous, and therefore, to provide the higher education institutions with larger powers is a logical development of the higher education system.

In the papers of El-Khawas, Elaine, Robin DePietro-Jurand, Lauritz Holm-Nielsen (1998), the necessity
to intensify competitiveness of the higher educational institutions by vesting larger powers to the higher educational institutions in the field of financial resources management, i.e., intensification of their financial autonomy, is determined.

Neave (1988) in his paper investigates the educational development trends, whereupon he emphasizes the role of autonomy in the higher education institutions of Western Europe for enhancing the quality of education.

Subject to the examination of reforms in the European higher education system, Amaral, Tavares, and Santos (2012) conclude that in most European countries, there are tendencies to grow up autonomy in the field of finance and more academic freedoms are provided to the higher education institutions to determine their educational programs.

At the same time, under the governmental approach to the higher education system in France, Boffo and Dubois (2005) state that the governmental interventions in planning of the higher education system are required for efficient planning of the economy.

Corrado Bighi (1993) emphasizes that autonomy of the higher education system expansion should give rise to the academic freedoms, which, in their turn, will increase its competitiveness in a particular country.

De Boer et al., in their papers de Boer, Enders, File, and Jongbloed (2010), de Boer and File (2009), de Boer, Enders, and Schimank (2007), outline that under the conditions of intensifying autonomy, the higher education institutions increasingly become separate agents of economic relations, therefore, it is important to identify the new methods to manage them.

Graham (2014) in the context of ideas of De Boer says that universities become an integral part of the system “education-economics-environment”, so the development of specific methods to ensure university competitiveness is significant.

Kyvik (2008) states that competition from the non-university educational institutions has defined the need for greater rights and freedoms for universities.

In the paper of Lisun (2016), it is researched that autonomy is a priority direction of development of the higher education system and in order to determine autonomy, it is expedient to resolve it into components.

Estermann (2011) testifies that the rules and conditions, whereunder the European universities operate, are characterized by a high degree of diversity. That diversity reflects numerous approaches to searching for a balance between autonomy and accountability in response to the society’s demands and changes in awareness of the public responsibility for higher education.

2. AIM

This article is aimed at examining the level of autonomy of the higher education system in Ukraine and at specifying its place in the European higher education area.

The following objectives are solved in the article: analysis of methodological approaches to calculation of the autonomy of the Ukrainian higher education system is carried out; mathematical tools for assessment of the place of the Ukrainian higher education system in the European educational area are substantiated; analysis of indicators of autonomy of the higher education system is carried out; the place of Ukraine in the European educational area is determined through taxonomy methods.

3. METHODS

Analysis of publications in the sphere of assessment of autonomy of the higher education system shows that there are two opposing approaches to its calculation. The first approach is based on determining a change in the level of autonomy in the time space. The trend, created within the framework of that approach, in respect to the level of autonomy of the higher education system, is in the direction of global
trends for increasing public freedom, which characterizes intensification of democratic processes in the society. This approach, in our opinion, quite qualitatively shows the global trends in development of the higher education system, however, firstly, it does not reflect diversification of countries by peculiarities of the national development of the higher education systems; secondly, such an assessment cannot be impartial enough, since the major trend of development of any country lies in democratization of the society. Therefore, presence of the opposite trend in the higher education system will at least upset the critics of state regulation, and at most it will designate a threat to the democratic development of the society.

The second approach is based on the spatial analysis of the level of autonomy of the higher education system, whereupon the groups of factors characterizing one part of autonomy or another are specified. This approach has much more objectivism, since the activities of the higher education system are regulated by the laws of the country, so specification of the indicators’ values is carried out on the basis of analysis of the legal and regulatory instruments of a particular state. This approach has been reflected in the writings of such scholars as Maassen, Neave, Ehrlich (2000).

The most well-known and widespread methods for researching the level of autonomy of higher education in Europe within the bounds of this approach are the ones proposed by the Autonomy University in Europe, which involves calculation of the four main components: organizational, staff, financial and academic. These components are interconnected with each other, thereby making it possible, from the system positions, to determine the level of autonomy of the higher education system through the overall indicator of autonomy (University Autonomy in Europe, 2000).

**Stage 1. Calculation of the indicators of higher education system autonomy**

1.1. Specification of autonomy indicators per components

   Methods of the Autonomy University in Europe

1.2. Survey of legal and regulatory instruments and specification of variable indicators

   Comparative analysis

1.3. Formation of the integral autonomy indicators per components and formation of the overall autonomy indicator of the Ukrainian higher education system

   Analytical calculations – integral method
   Expert method

**Stage 2. Specification of the place of the higher education system in the European area by the autonomy**

2.1. Formation of clusters of countries per components of autonomy

   Taxonomy method – Cluster analysis

2.2. Formation of clusters of countries on the overall autonomy indicator

2.3. Analytical analysis of the obtained clusters, specification of their peculiarities

   Comparative analysis

**Figure 1. Algorithm of examining the autonomy of the higher education system in Ukraine**
The procedure for calculating the level of autonomy is as follows. Each component of the overall level of autonomy contains a list of local indicators that reflect specific features of such component. A certain local indicator has got several variables assessing in percentage the level of autonomy of the higher education system. Only one variable can occur in each indicator per time. Values of all the local indicators are combined with the additive convolution into one integral indicator per component, which further forms the overall indicator of the level of autonomy of the higher education system.

To determine the level of autonomy of the higher education system of Ukraine, it is important not only to calculate the indicator of autonomy, but also to specify the place of the Ukrainian higher education system in the European educational area. In order to achieve this goal, it is proposed in the paper to use the method of cluster analysis: the k-average method. Feasibility of using the cluster analysis is grounded on two lines of research as follows:

1) formation of autonomy clusters of the higher education systems simultaneously for all the groups of indicators, permitting to determine the spatial characteristics of autonomy of the higher education system of Ukraine;

2) specification of autonomy indicators per component (financial, organizational, academic and staff), making it possible to identify bottlenecks in intensification of autonomy of the Ukrainian higher education system.

Thus, in general, the research algorithm is presented in Figure 1.

### 4. RESULTS

#### 4.1. Formation and calculation of indicators of autonomy of the higher education system

Subject to the analysis of legal and regulatory documents on development and regulation of the educational services market (Law of Ukraine “On Higher Education”, 2014) in Ukraine, the value of the autonomy components of the higher education system is calculated (Table 1).

The interpretation of values of the integral indicator of the level of autonomy is as follows: the closer is the estimated value to 1, the higher is the level of autonomy of the higher education system from state regulation.

The following conclusions can be made based on Table 1:

1. The highest level of autonomy is peculiar to the staff (among the four components of autonomy) and organizational (in comparison with other countries) components of the higher education system of Ukraine. The staff autonomy is related to high capacities of the Ukrainian universities to provide their personnel potential. Autonomy of the organizational component is due to delegation of powers to the universities to determine the management bodies.

2. If compared with the European countries and regions, Ukraine has a low level of autonomy across all its components, according to the calculations concerning the rank of Ukraine among 29 countries under review. This is due

#### Table 1. Integral values of the autonomy components of the Ukrainian higher education system

<table>
<thead>
<tr>
<th>Components</th>
<th>Value of integral indicator per component</th>
<th>Place of Ukraine among other countries*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic</td>
<td>0.25</td>
<td>25</td>
</tr>
<tr>
<td>Financial</td>
<td>0.29</td>
<td>29</td>
</tr>
<tr>
<td>Staff</td>
<td>0.33</td>
<td>23</td>
</tr>
<tr>
<td>Organizational</td>
<td>0.3</td>
<td>22</td>
</tr>
</tbody>
</table>

*Information as of 2016 about 28 countries and regions of Europe Autonomy University in Europe, besides Ukraine, has been used in the research. Among 28 countries, there are 3 regions of Germany, as they have their own legislation concerning the higher education system, which are different from other regions of Germany.
to a significant state interference in activities of the universities and a rigid administration of the Ukrainian higher education system.

4.2. Specification of the place of Ukraine in the European educational area through the use of taxonomy methods

The first line of research through the cluster analysis makes it possible to identify homogeneous groups of countries by development of the higher education autonomy. In order to identify the best quality of forming homogeneous groups of countries in terms of autonomy, two experiments have been conducted with formation of three and five clusters. The following criteria are used to determine the quality of clusterization:

1) availability of intersection between the clusters, which is investigated through the use of the graphical analysis;

2) discrimination criterion determining the percentage of the items correctly assigned to the clusters.

According to the examined criteria, clusterization into five groups (with a smaller intersection between the clusters and 100% attribution of existing rotations to the cluster groups) is found to be more qualitative. Values of the average cluster indicators per component of autonomy of the higher education institutions are shown in Figure 2.

Table 2 shows the list of countries per obtained cluster of the overall autonomy of the higher education system and identifies their features.

Information in Figure 2 indicates that the average cluster values per component form clusters with a small intersection, resulting in a high quality economic interpretation of each of them.

Cluster 1. This cluster is characterized by a high level of the academic autonomy, while the financial autonomy is rather low. This case is typical for the countries with a strong state regulation in all spheres of activity of the higher education institutions; and the universities are granted with authority to render educational services and training. The vast majority of the countries included in this cluster are German-speaking countries and states.

Cluster 2. It is characterized by a high level of the financial autonomy. This cluster includes the countries, where the overwhelming proportion of the higher education institutions is financed independently from the state or out of their own money, or through special funds. Financial independence of the higher education institutions is peculi-

Figure 2. Division of the average values per autonomy component for five clusters

Note: OA means the organizational component of autonomy, FA means the financial component of autonomy, SA means the staff component of autonomy, AA means the academic component of autonomy

Source: Developed by the author.
Liar for such countries as Italy, Portugal and Spain, which is primarily due to the traditional development of the higher education system at the cost of private sector.

Cluster 3. This cluster’s countries are the leaders in all the aspects of autonomy of the higher education system. There, the higher education has got high standards of quality, alongside each educational institution represents a separate independent unit of the educational market, which has its own rules and for which the national business rules form the basis for independent development. These countries include UK, Ireland, Denmark, Finland (pursuant to the traditional system) and Estonia, as the educational market of the latter has undergone significant transformations from the Soviet command-administrative system to a complete autonomy.

Cluster 4. It is characterized by a significant level of the staff autonomy. The vast majority in this cluster is occupied by the countries of Eastern Europe and the former USSR countries: Latvia, Lithuania, Poland, Czech Republic.

Cluster 5. This is a cluster with the low level of autonomy in higher education. It includes four countries: Greece, Turkey, France and Ukraine. This situation is due to the national peculiarities of development of the higher education systems in the said countries. For instance, in France, the low autonomy is featured by a strong state regulation, while the higher education system’s level is of high quality. Ukraine as one of the former USSR countries also has a high level of governmental intervention. However, the system of higher education in Ukraine is under a systemic update. Thus, on the one hand, the state has already reduced administrative levers of regulation and legislated the need to increase the level of autonomy of the higher education institutions, but, on the other hand, the universities have not gained actual opportunities for implementing their autonomy yet, which would provide a high level of education. Therefore, it is essential to identify the ways to increase the competitiveness of the Ukrainian higher education system.

In the second line of researching the overall indicator of autonomy through the use of the cluster analysis, five homogeneous clusters have been identified: with a very high level of autonomy, high autonomy, middle level of autonomy, low level of autonomy, and a very low level of autonomy. The division of countries among these clusters is shown in Table 3.

3. The clusters with very high and very low levels of the overall autonomy of the higher education system (see Tables 2, 3) do not differ from the previous clusterization.

4. There is a slight migration in the middle clusters, which is connected with synergetic effect upon combination of the autonomy components.

Thus, clusterization of the higher education systems has made it possible to form similar levels of development of autonomy of the country, which permits determining the peculiarities of development of autonomy therein.

Thus, clusterization of the higher education systems enables to shape up the countries similar by levels of the autonomy development, thereby making it possible to determine the peculiarities of their autonomy’s development. On the one hand, unfortunately, Ukraine is included into the group of countries with a very low level of autonomy, but, on the other hand, it is due to the national specificity of development of the higher education system and,

Table 2. Division of countries and German states according to the dominant components of the overall autonomy of the higher education systems of the countries

<table>
<thead>
<tr>
<th>Cluster 1</th>
<th>Cluster 2</th>
<th>Cluster 3</th>
<th>Cluster 4</th>
<th>Cluster 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>Spain</td>
<td>UK</td>
<td>Latvia</td>
<td>Greece</td>
</tr>
<tr>
<td>Brandenburg</td>
<td>Italy</td>
<td>Denmark</td>
<td>Lithuania</td>
<td></td>
</tr>
<tr>
<td>Hessen</td>
<td>The Netherlands</td>
<td>Estonia</td>
<td>Luxembourg</td>
<td></td>
</tr>
<tr>
<td>Iceland</td>
<td>Portugal</td>
<td>Finland</td>
<td>Poland</td>
<td></td>
</tr>
<tr>
<td>Cyprus</td>
<td>Slovakia</td>
<td></td>
<td>Czech Republic</td>
<td></td>
</tr>
<tr>
<td>Norway</td>
<td>Hungary</td>
<td></td>
<td>Switzerland</td>
<td></td>
</tr>
<tr>
<td>South Rein-Westphalia</td>
<td></td>
<td></td>
<td>Sweden</td>
<td></td>
</tr>
</tbody>
</table>

Source: Developed by the author.
in the context of dualism, the concept of autonomy must be determined, where the edge of efficient autonomy of the higher education institutions lies.

The following objectives are solved in the article:

• analysis of the methodological approaches to calculation of autonomy of the higher education system of Ukraine is carried out;
• mathematical tools for assessing the place of the Ukrainian higher education system in the European educational area are substantiated;
• analysis of indicators of autonomy of the system of higher education is carried out;
• place of Ukraine in the European educational area is specified through taxonomy methods.

### CONCLUSION

The following conclusions can be made based on the made researches.

1. The nature of autonomy of the higher education institutions exerts a dual influence on development of the higher education system in the country, which is conditioned by the human nature and opportunities as for using freedom in a particular area of the society’s life. Such a dual nature requires understanding that a low level of autonomy (France) is not always an indicator of the poor level of education, but it is mostly conditioned by the traditional approach to managing the system of higher education. The governmental approach to management of the higher education institutions is conventional for both Ukraine and France; therefore, it is expedient to use the modern management experience in the context of the European trend of autonomy enhancement.

2. For studying autonomy, a number of methodological approaches is used, with the most widespread approach proposed by the Autonomy University in Europe. Within this approach, assessment of the overall level of autonomy of the country’s higher education system is based on such components as financial, organizational, staff and academic ones. Calculation of the local autonomy indicators per component has shown that the higher education system of Ukraine has the greatest autonomy in the organizational and staff components, but it takes one of the lowest ranks in the European educational area in terms of the overall autonomy and its components, which fact is conditioned by the traditional system of higher education in Ukraine.

3. The cluster analysis has been carried out on two lines of the research and made it possible for us to obtain spatial distribution of the countries both by the level of autonomy development per component and by the overall indicator of autonomy of the higher education system. It is determined that the most effective method is to divide countries into five homogeneous groups. Within the framework of the first (spatial) line, the specifics of development of each group are identified. In the second research line, the connection between the obtained groups by overall indicator of autonomy and distribution of countries in a spatial sense is determined. Ukraine is included into the cluster with the low level of autonomy for all components. However, this cluster is not homogenous. Thus, on the one hand, there are Turkey and Greece, which, despite the low autonomy, have far from the

### Table 3. Structure of cluster groups by the level of overall autonomy

<table>
<thead>
<tr>
<th>Very high</th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
<th>Very low</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>Austria</td>
<td>Spain</td>
<td>Latvia</td>
<td>Greece</td>
</tr>
<tr>
<td>Denmark</td>
<td>Brandenburg</td>
<td>Italy</td>
<td>Lithuania</td>
<td>Turkey</td>
</tr>
<tr>
<td>Estonia</td>
<td>Iceland</td>
<td>Portugal</td>
<td>Poland</td>
<td>France</td>
</tr>
<tr>
<td>Ireland</td>
<td>Norway</td>
<td>Slovakia</td>
<td>Czech Republic</td>
<td></td>
</tr>
<tr>
<td>Finland</td>
<td>South Rein-Westphalia</td>
<td>Hungary</td>
<td>Switzerland</td>
<td>Ukraine</td>
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<tr>
<td></td>
<td>The Netherlands</td>
<td>Cyprus</td>
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<tr>
<td></td>
<td>Sweden</td>
<td>Luxembourg</td>
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</tbody>
</table>
Thus, the conducted researches have proved relevance of the analysis of autonomy of the higher education system, necessity for further examination of advantages and contradictions of autonomy. In our opinion, a high quality of rendering the educational services is the major condition for functioning of the educational market. Therefore, further it will be vital to determine the peculiarities per cluster at the level of local indicators and, as a consequence, to find a certain balance between autonomy of the higher education institutions and state governance and regulation of their activities.

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