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## **METHODOLOGICAL APPROACHES TO ASSESSING THE EFFECTIVENESS OF INTERNATIONAL INTEGRATION ASSOCIATIONS**

**Abstract.** In the article, the author attempted to build a unified approach to measuring the effectiveness of integration associations regardless of their regulatory formats and species. existing approaches were analyzed to achieve this goal, while composite index methods were subject to detailed analysis. The author reveals the essence of this method, shows their main four subspecies, identifies their differences, advantages and disadvantages. The limitations of using the composite index technique in terms of compliance with the aggregation of indicators are given. It is proposed to use a three-stage method of constructing a composite index of regional integration taking into account these limitations. An important step in the development of a composite index is the determination of the significance (weight) of each indicator (sub-index), which can be determined using mean, parametric and non-parametric methods. For each of these methods, the specific characteristics peculiar to each of them are given. The results of the study made it possible to develop basic methodological principles for the formation of indicators of the composite index for measuring the effectiveness of integration. Moreover, the author justified possibility of joint use of the methods of aggregation of indicators considered in the work, at the same time it has been revealed that the composite index using the method of the main components is the most informative.

Major results and conclusions of a research can be applied in the course of measurement of efficiency and the level of integration associations integratedness for matching and comparing relevant indicators of several integration associations.

**Keywords:** international integration, integrative associations, efficiency assessment, integration level, composite index.

**Introduction.** At present, the continued progressive and sustainable development of the world economy in the context of globalization necessitates the use of the potential of integration associations to increase the growth reserves of individual national economies. As the established world practice of international integration groupings shows, the achievement of a positive effect of integration is possible in the context of the systematization and complexity of the integration process itself, the strategy, the model and the tools for its development. Thereby, further development of the theory and methodology for determining the effects of integration, as well as the justification of methodological approaches to assessing the effectiveness of integration associations is becoming increasingly relevant.

**Results and discussion.** In consequence of spreading different forms of international integration, the world economy has currently formed two approaches to its classification. According to the first approach, integrations differ in goals when integrating countries pursue the same or different goals. Herewith national economies can be at the same stage of economic development, and differ in level of development, and the purpose of integration for them is to obtain additional markets, attract investment, open new jobs, etc. Under the second approach, forms of integration can be classified according to regulatory objectives: integration to improve the efficiency of the market economy, and integration for development [1]. In the first case, it is about integration associations that contribute to increased competition in the domestic integration market, in the second case, about associations of production factors, knowledge and efforts to build up the competitive advantages of the integration association on the world stage.

On the one hand, the approaches considered could facilitate the task of choosing methods for assessing the effectiveness of integration associations, on the other hand, today there are such integration associations in the world that cannot be specifically classified fully as groups of integration associations considered. For example, the Eurasian Economic Union (EAEU) and the Association of Southeast Asian Nations (ASEAN) have mixed goals [2], they have elements of different forms of integration, while the European Union (EU) model can be defined by a second approach. Therefore, the methodological approaches to measuring the effectiveness of integration applied in the EU cannot be applied in an unadapted form in relation to the EAEU and ASEAN.

At present, composite indices are often used to assess the effectiveness of integration associations, less often - indices of industry level. The latter are aimed at identifying the specific characteristics of a particular integration Association. Industry-level indexes may include the intraregional trade intensity index, which is determined by the ratio of intraregional trade to the region 's share of world trade; an asymmetric indicator reflecting the degree of attachment of intraregional trade to its region, which is determined by the ratio of the share of intraregional trade to the share of the region in world production [3], [4].

According to the method of composite indices, the processes of development of international economic integration are divided within the stages put forward by B. Balass professor of Yale University: free trade zone; customs Union; common market; economic and monetary Union; political Union [5]. The method of composite indices involves the assessment of the identified stages by 20-25 indicators, such as the unity of markets for goods, services, labor, fund, the level of economic convergence, the conformity of institutions with the goals of integration, etc. The composite index itself is determined by simply summing up the indicators of the five stages, while an index of 100 points means full integration [6]. Currently, the methods of composite indices used in the world practice vary greatly due to the dissimilarity of integration associations. There are the following subspecies of composite indices of the integration effect measurement:

The main focus in the assessment is on the institutional progress of integration. The classification of stages is based on the 5-stage scheme of regional integration development proposed by B. Balass. Each stage is rated between 0 and 25 points, and the composite index is between 0 and 100 points. The index allows periodic monitoring on a continuous basis. However, any of the estimated indicators can be estimated randomly, depending on the preferences of the researcher.

1) The composite index used by the European Commission aims to assess progress in creating a single European Union market. The main data sources are the value of contracts as a percentage of gross domestic product. The advantages of the index include traceability of the dynamics of integration over time, the disadvantages-the inability to use it to assess other underdeveloped integration projects, such as the EAEU.

2) The composite index of Berger H. and Nisch F. in fact, it is similar to the first subspecies, but with three stages of analysis: the elimination of quantitative restrictions in trade; the rejection of tariff restrictions; the completion of the formation of the single market. Indicators reflecting the essence of the integration process within its time frame are selected for each of them. The index allows to evaluate the progress of each country in the integration process. The disadvantages are similar to the first subspecies of the index above.

3) The fourth sub-type of composite index was developed by the University for Regional Integration [7]. The essence of the method was to rank the participating countries according to the degree of their share in strengthening the integration association on the basis of the most important indicators, as a share of the volume of trade within the integration association in the total volume of foreign trade of each share of countries in GDP in an integration association; degree of convergence; homogeneity of integration integration; GDP per capita; the purchasing power of the country in relation to the total in the integration association, etc. The methodology was developed specifically for the European Commission. Approbation of the research results on the example of the European Union showed growth in the gap in economic performance between the core and the periphery of the EU, which had a negative impact on enhancing

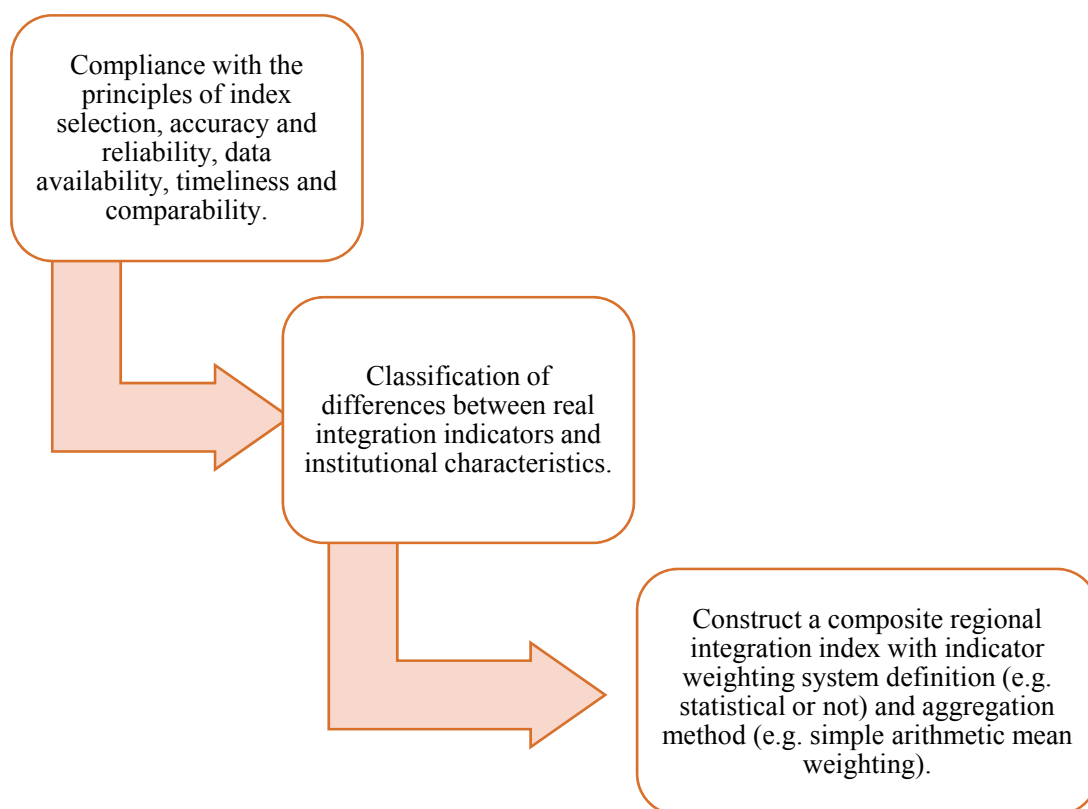
connectivity. Besides this methodology revealed that EU cycles and trends were least extended to Italy, Spain and Greece.

As D. Lombarde and others rightly point out, despite a number of attempts to develop composite indices of regional integration, none of them can be applied systematically on a permanent basis [8]. Indeed, the differences in approaches to monitoring and evaluation of regional integration identified in the article and significant differences within the selected approaches in time make it difficult to use the developed indices and indicators in practical activities.

When using the method of composite indices, it is necessary to observe aggregation of indicators, which are expressed in the following [9]:

- not the volatility of the index values, since the index reflects the gradual process of economic integration;
- the proportion of each constituent index does not have to be high to dominate the aggregate index.

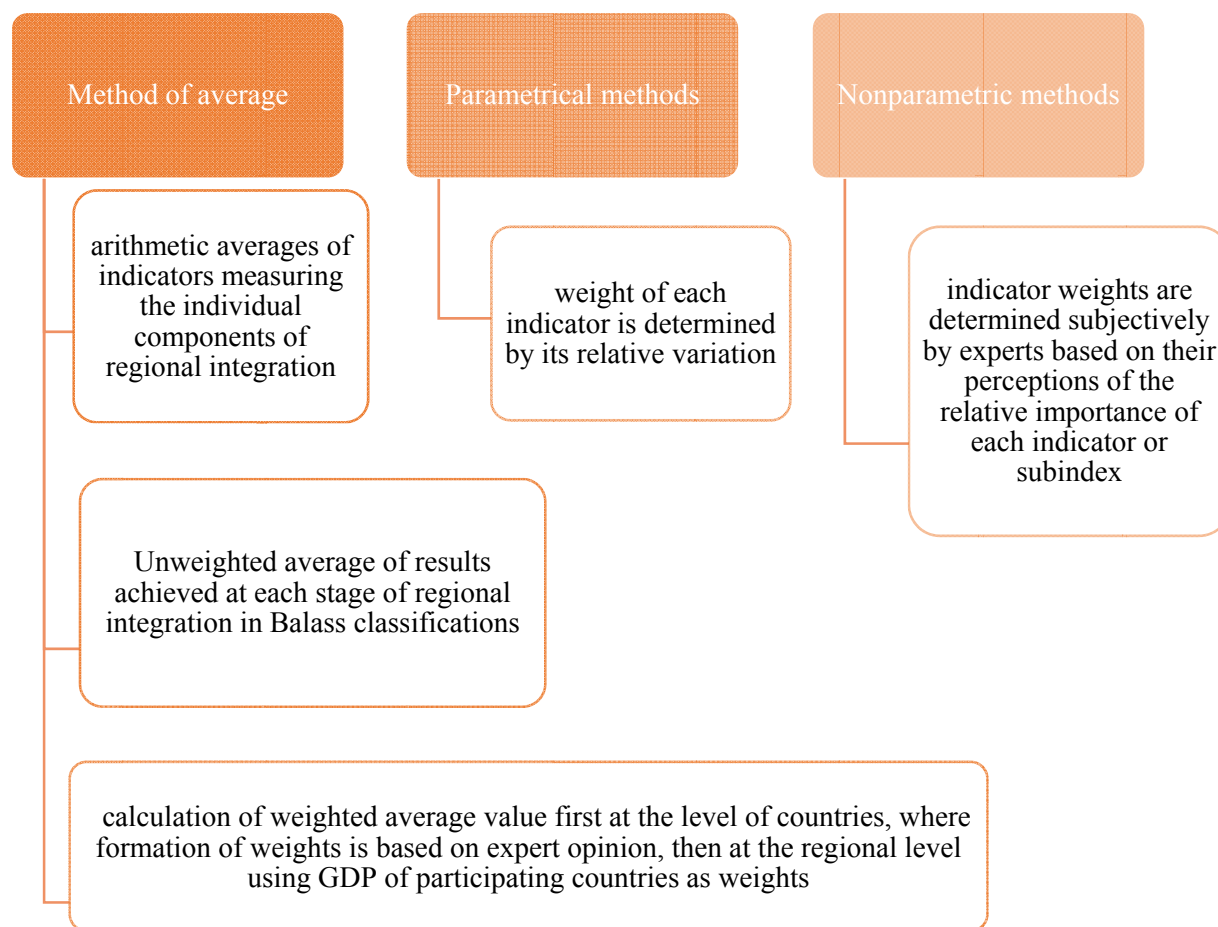
The limitations indicated require a clear elaboration of the possibilities of using summary indicators, which is feasible by using the following three-step method shown in Figure 1.



Note: made by source [10]

Figure 1 - Three-step method of constructing a composite regional integration index

During composite index construction it is important to determine the weights of the index components. However the issue is typical non triviality since neither the scientific community nor international organizations have established generally accepted principles for weighing the importance of individual indicators in the composite index. At the same time, there are three more common approaches to aggregation of indicators: the method of averages, parametric and nonparametric methods (figure 2).



Note: compiled by the author based on sources using [11], [12], [13], [14].

Figure 2 - Approaches to aggregation of composite index indicators

The method of averages is the oldest and it was popular before the spread of B. Ballass' theory. However, arithmetic averages are increasingly used in practice. According to the B. Balassa method, the unweighted average is calculated by the European Commission, and the more complex, third type of average method, shown in figure 2, is used by the United Nations Economic Commission for Africa, despite the duration and complexity of the procedure. Among all the approaches under consideration, parametric methods, in particular the principal component method, have recently been increasingly used [15]. The method of principal components allows one to reduce the dimensionality of data by losing the least amount of information [16]. Among the disadvantages of the method, one can single out the lack of an economic interpretation of the estimation of regression parameters.

**Conclusions.** The lack of a unified approach to measuring the effectiveness of regional integration in the scientific literature and practice is due to a number of reasons. These reasons are, first, the inability to fully harmonize the activities of statistical services of integrating countries, which causes the problem of comparability of different indicators, second, methodological difficulties in determining the weights (importance) of subindexes included in the composite index of indicators.

The development of a unified approach to measuring the effectiveness of regional integration groupings is also complicated by their diversity and management formats, as well as by the specific economies of the integrating countries. Nevertheless, the comparison of indicators of integration indicators based on common methodological approaches makes it possible to estimate the level of integration in any integration association, provided that the following methodological principles for the formation of indicators of the composite index of integration effectiveness assessment developed by the author are observed:

- compliance with the stages of economic integration;
- Separation of types of economic integration (global and regional; Macroeconomic and sectoral integration);
- comparability of the integration degree assessment of a particular integration association with estimates for other integration associations.

After formation of composite index indicators taking into account the above principles, calculation of composite index should be performed by summation of weighted average subindex of integration directions. Herewith fair index value depends heavily on the method of selecting the weights of each subindex that were described in the article. The importance of each sub-index for the integration Association can be determined by the form of integration, the level of development of the integration association and its participants, etc. For this reason, the approaches studied in this work can be applied jointly. However, based on the diversity of integration indicators and their different values for different integration groups, the determination of the weight of each sub-index is preferably carried out using the principal component method, which allows to determine the contribution of each indicator to the information content of the sub-index.

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### **ХАЛЫҚАРАЛЫҚ ИНТЕГРАЦИЯЛЫҚ БІРЛЕСТІКТЕРДІҢ ТИІМДІЛІГІН БАҒАЛАУДЫҢ ӘДІСТЕМЕЛІК ТӘСІЛДЕРІ**

**Аннотация.** Мақалада автор интеграциялық бірлестіктердің тиімділігін оларды реттеу форматы мен түрлеріне байланыссыз бағалаудың бірегей тәсілін құрастыруға талпыныс жасаған. Осы мақсатқа жету үшін қолданыстағы тәсілдер талданып, оның ішінде композиттік индекстер әдістері түбегейлі зерттелген. Автор осы әдістің мәнін ашып, олардың төрт түрінің айырмашылықтарын, артықшылықтары мен кемшіліктерін анықтаған. Композиттік индекстер әдістемесін қолдану барысында көрсеткіштердің агрегациясын қадағалаудағы шектеулер көрсетілген. Осы шектеулерді ескеретін аймақтық интеграцияның композиттік индексіні қалыптастырудың үш баспалдақты әдісін қолдану ұсынылған. Композиттік индексті әзірлеудің маңызды кезеңі ретінде әр көрсеткіштің маңыздылығын (салмағын) анықтау белгіленген, олардың орташа мәндер әдісі, параметрлік және параметрлік емес әдістер арқылы есептелетіндігі көрсетілген. Осы әдістердің әрқайсысының ерекше сипаттары көрсетілген. Жүргізілген зерттеу нәтижелері интеграция тиімділігін бағалаудың композиттік индексіні қалыптастырудың негізгі әдістемелік қағидаларын әзірлеуге мүмкіндік берген. Одан басқа, автор көрсеткіштерді агрегациялаудың осы жұмыста қарастырылған әдістерін бірге қолдануға болатындығы туралы ұйғарым жасаған және солай бола тұра, композиттік индексті құрастыруда ақпараттылық деңгейі ең жоғарғы әдіс ретінде негізгі компоненталар әдісін атаған.

Зерттеудің негізгі нәтижелері мен ұйғарымдары бірнеше интеграциялық бірлестіктердің тиімділігі мен деңгейін бағалау көрсеткіштерін өзара салыстыру барысында қолданысын табуы мүмкін.

**Түйін сөздер:** халықаралық интеграция, интеграциялық бірлестіктер, тиімділікті бағалау, интеграциялану деңгейі, композиттік индекс.

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### **МЕТОДИЧЕСКИЕ ПОДХОДЫ К ОЦЕНКЕ ЭФФЕКТИВНОСТИ МЕЖДУНАРОДНЫХ ИНТЕГРАЦИОННЫХ ОБЪЕДИНЕНИЙ**

**Аннотация.** В статье автором осуществлена попытка построения единого подхода к измерению эффективности интеграционных объединений вне зависимости их форматов и видов. Для достижения этой цели были проанализированы существующие подходы, при этом к подробному анализу были подвержены методы композитных индексов. Автором раскрыта сущность данного метода, показаны их основные четыре подвиды, выявлены их различия, преимущества и недостатки. Приведены ограничения при использовании методики композитных индексов в части соблюдения агрегации показателей. Предложено использование

трёхступенчатого метода построения композитного индекса региональной интеграции с учётом этих ограничений. В качестве важного этапа разработки композитного индекса указано определение значимости (веса) каждого показателя (подиндекса) которые могут быть определены посредством использования методов средних значений, параметрических и непараметрических методов. По каждому из этих методов приведены специфические характеристики, свойственные каждому из них. Результаты проведенного исследования позволили выработать основные методологические принципы формирования показателей композитного индекса оценки эффективности интеграции. Кроме того, автором обоснована возможность совместного использования рассмотренных в работе методов агрегации показателей, при этом выявлено, что композитный индекс с использованием метода главных компонент является самым информативным.

Основные результаты и выводы исследования могут быть применены в процессе измерения эффективности и уровня интегрированности интеграционных объединений для сопоставления и сравнения соответствующих показателей нескольких интеграционных объединений.

**Ключевые слова:** международная интеграция, интеграционные объединения, оценка эффективности, уровень интеграции, композитный индекс.

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