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DIFFERENCES IN INTEGRATION UTILITY OF THE EU MEMBER STATES

An attempt is made to differentiate utility that member states receive from their participation in a particular international union. Determinants and components of integration utility are considered as well as possible methods to estimate the latter are discussed. One of the methods (in particular index technique) is applied with respect to the EU. The composite indexes of integration utility, calculated in this way, show significant per-state variation of integration benefits in the EU.

Keywords: integration, utility, international union, member state, European Union, index, benefit.

Бояр А. Различия в интеграционной полезности для государств-членов Европейского Союза. *Предпринята попытка дифференцировать полезность, которую государства получают от участия в определенном интеграционном объединении. Рассмотрены детерминанты и компоненты интеграционной полезности, а также возможные методы ее оценки. Один из методов (в частности индексный) используется относительно Европейского Союза. Рассчитанные таким образом интегральные индексы интеграционной полезности демонстрируют существенное расхождение у государств-членов ЕС по выгодам от интеграции.*

Ключевые слова: интеграция, полезность, интеграционное объединение, государство-член, Европейский Союз, индекс, выгода.

Background. International integration has accelerated significantly during last decades worldwide. The process seems to be inexorable and the vast majority of the world countries are involved in it. It makes the issue of international integration interesting and important in cognitive terms especially when consequences and effects of a particular international or supranational integration project are under consideration. In this article a methodology to estimate utility of an international union member states is proposed.

Utility is a term used to describe gains of a person from some activities undertaken by it. The utility of the consumed goods (or a set of goods) is the most widespread case in Economics. In this study we refer to the utility obtained by member states of an international union as a result of their participation in the integration project under consideration (further – integration utility). There is no doubt that integration utility distributes unevenly among integrating countries since their preferences differ. To make an attempt to differentiate this category in per state split for particular international union (the EU) is what we undertake further.

It must be noted that an international union in this study is regarded as a voluntary association of sovereign states that decide to centralize or coordinate certain policies and confer corresponding powers to central supranational bodies.

The main difficulties of quantitative evaluation of integration utility occur when we go beyond economic effects and undertake an attempt to assess environmental, social, security and political outcomes of integration as they cannot be directly quantified. Furthermore, in practice all components of integration utility are interlinked and correlated which makes it even more complicated to carry out the structural analysis of this category.

It is difficult to operate with the category «utility» (as well as «preferences») because there is no unity of interests among member states of an international union. Therefore, the universal formula to determine absolute values of integration utility cannot be applied. The same conclusion but with respect to consumer utility was made by J. Hicks in late 1930-s [1].

Analysis of recent research and publications. The notion of integration utility was shortly discussed only in two earlier studies. A. Alesina, I. Angeloni and F. Etro [2] and J. Simon and J. Valasek [3] treat it as a determinant of states' behavior under conditions of integration. However we haven't revealed other studies dealing with the issue of integration utility in other contexts or focusing on this concept as a primer object of research.

The relationship between interstate redistribution of international union budgetary funds and economic benefits that members of the union attain from the integration has become a principal issue of two theories. The first one – national costs/benefits theory – was developed by C. Carruba [4] and S. Hix [5]. According to this theory international union budget is an equilibrium outcome of intergovernmental bargains during which members that are more interested in creation of a common economic space (primarily export-oriented economies) «buy» acceptance of the market liberalizing policies from countries that gain less (or lose) in the process. The authors argue that the EU case confirms the theory. Their approach as for using intra-export indicators as proxies to describe (differentiate) economic benefits from integration is employed here in our study as well.

The theory of economic needs is the second one. Its developer [6] considers fiscal transfers (in the EU) as a function of economic needs. That is the poorer (by GDP per capita) the union member is, the larger net budgetary transfers it receives. However evidence for this theory was found only for the EU case. For most other international unions it is not likely to work since the EU so far has carried out redistributive cohesion policy not proper for international unions.

The **aim** of the article is to propose a method for estimation of integration utility of states (countries) from their membership in a particular international union and to apply this method for the European Union case.

Materials and methods. Integration utility is a direct consequence of outcomes of international union policies. The latter, being a reflection of the union goals, are realized through regulatory (legislative and institutional framework) and fiscal (budgetary revenues and expenditures) tools. Legislative and institutional framework of a union includes its legislation in force, set of institutions, location of their headquarters, decision-making procedures[1] etc. All these links are demonstrated in *figure 1*.

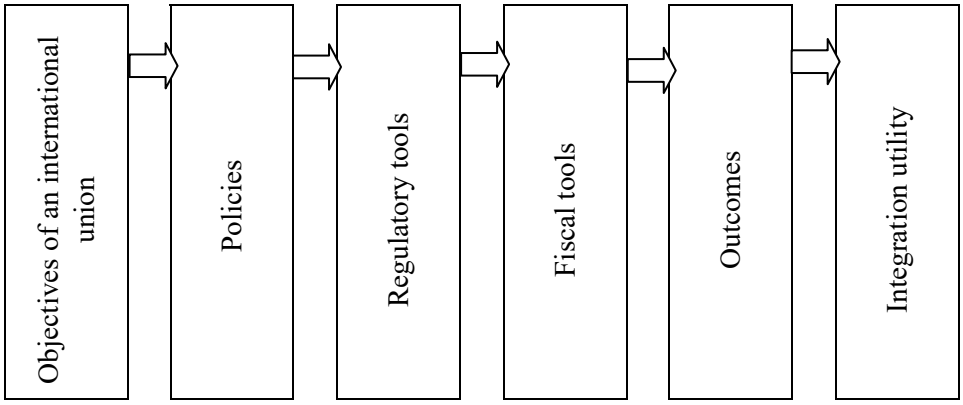

Figure 1. Relationship between objectives of an international union and its members' integration utility

Source: developed by the author.

Union institutions can be empowered for policies where members' preferences are considerably heterogeneous. In that case some of the states can appear to be short in expected effects from the integration project and as a result their utility will decrease. Similar results may occur if there are glitches at any link of the demonstrated in the *figure 1* chain.

[1] As for decision-making procedures there is evidence that members that are more represented in bodies of a union can bargain more beneficial projects (and hence get more utility) financed through union budget via vote-trading mechanisms [7; 8].

Generally speaking, utility is quite complex category. For members of an international union it is determined by a number of economic, political, social, security and other factors. When economic integration is in the main focus economic characteristics (components) of utility obviously come forth. Among others they include enlargement of markets accessible for national products, enhancement of production factors mobility and, as a result, their better allocation, improved conditions for investments and competitiveness. Finally it leads to stabilization and acceleration of economic growth. Actually all these parameters can be quite precisely described quantitatively and used to differentiate utility created by integration for members of the union.

But integration utility has not only macroeconomic dimensions. There are also social (including socioeconomic), security, political and ecological benefits of integration. They are expressed in improved well-being and quality of life and work of citizens, strengthened security guarantees of a state, increased political «weight» of a state inside and outside the union, improvement of environmental situation in the regions of a state respectively.

Integration utility can be estimated individually for each member or universally according to «one for all» formula. It is possible to use the latter approach because of quite steady understanding of integration utility components for all members (economic, social, political, security and ecological). But using universal approach doesn't allow taking into account possible difference in the «weight» of these utility components for different states. This shortcoming is not proper for individual approaches but the latter can be fraught with subjective, biased and discriminative with respect to other members' estimation. To avoid these problems some combination of the two approaches should be employed.

As we see it there are three methods based on universal approach that can be used to estimate integration utility. They are index, proxy or econometric techniques.

Index utility indicators should result from synthesis of quantitatively expressed determinants of various components of the utility. Indicators describing the components should allow for variations in size of member states (in economic potential, population, area), that is they should be expressed in relative but not absolute terms. Each utility component should be estimated in terms of its share in total utility and appropriate weight coefficients established. The weight coefficients can vary significantly depending on the type and level of international union. In case of free trade area or custom union economic and socio-economic utility components will be dominant. Single market and, moreover, economic union will additionally include political, security and, possibly, ecological utility. For example, *composite index of integration utility* (R_i) for each state *i* taking

part in a complicated in form international union[2] for a particular period of time can be calculated as follows [4]:

$$R_i = a\,En_i + b\,SE_i + c\,Sr_i + d\,Pl_i + \mathrm{g}\,El_i, \quad (1)$$

with *a, b, c, d, g* being weight coefficients for each utility component including:

En – an economic component that reflects improved conditions for national producers of goods and services and for economic development in general;

SE – socioeconomic component showing improved well-being, quality of life and work of citizens;

Sr – security component that demonstrates strengthened security guarantees (political and military, energy, food, etc.) of a state;

Pl – political component (increased political «weight» of a state inside and outside the union);

El – environmental component reflecting improvement of the environmental situation in the regions of a state.

We use this index technique to assess integration utility of the EU Member States in this paper (see next section).

Employing proxy technique a researcher uses separate indicator(s) that, in his/her view, is the best one to reflect integration utility (effects). In case of free trade area or custom union values of intra-export can serve as such proxies since those types of international unions provide mainly for trade liberalization. The fact that there is no single statistical indicator that could stand for a proxy of all the utility components taken together is the main weakness of a proxy technique. It also allows manipulating with the utility category using different proxy indicators. Simplicity in understanding and use are the technique's advantages.

Econometric methods can also be applied to establish relationship between integration utility (dependent variable) and its determinants (independent variables). However it doesn't seem possible to build up corresponding regression model without preliminary estimation of utility values using the first two or some other techniques.

Individual approach can be based on the same (as the universal one) techniques but correction to peculiarities of each member state should be made. Mainly it concerns of the weight coefficients in the equation (1).

Finally, it should be noted that the suggested methods do not provide calculation of absolutely true values of integration utilit. But they definitely can be used to differentiate these categories and that is enough for our analysis.

Results. Relative integration utility estimates are obtained for 2017 using index technique shortly presented above (equation (1) and discussed in more details in our earlier study [9]. But to demonstrate how the technique is adjusted to the EU case we need to be more specific.

[2] The one that create sall five utility components.

Weight coefficients from the expression 1 are obtained by making them proportional to the number of union bodies that operate within each of the integration utility components. For instance, we revealed 77 institutional structures operating in the EU[3]. 35 of them serve production and macroeconomic purposes (component *En*), 44 pursue socioeconomic goals (*SE*), 17 deal with security issues (*Sr*), 13 operate within political utility component (*Pl*) and 8 – within ecological component (*El*)[4]. Having determined a share of each group in total quantity of structures we obtained fractions (that theoretically could range from 0 to 1) that reflect institutional «attention» to and, thus, political weight of each sector of common interest in the EU in *table 1*. These are the figures treated as weight coefficients for the utility components[5]. Hence, composite indexes of integration utility for each of the EU Member States can be calculated on such formula:

$$R_i(\text{EU}) = 0{,}299\,En_i + 0{,}376\,SE_i + 0{,}145\,Sr_i + 0{,}111\,Pl_i + 0{,}068\,El_i\,. \qquad (2)$$

But in order to do it we need good proxy indicators for each of the utility component. Having considered a few possible alternatives[6] we have chosen:

- a percentage share of intra-exports of goods and services in total exports of a state (averaged for years 2008–2017) as a proxy for economic component (*En*);
- a percentage share of citizens who think that their country's membership in the EU is a good thing as a proxy for socioeconomic component (*SE*);
- a percentage share of citizens who support (are «for») the EU common defense and security policy as a proxy for security component (*Sr*);
- a percentage share of citizens who support (are «for») the EU common foreign policy as a proxy for political component (*Pl*);
- a percentage share of citizens who think that the EU plays positive role in protecting the environment as a proxy for ecological component (*El*).

In our opinion it is hard to find better proxies for the first two utility components (the most weighted ones). But for the rest of them the issue is rather debatable. In cases where we use sociological data as proxies it is assumed that a representative citizen has an adequate vision (perception) of benefits received by his/her country from membership in the EU. Public opinion data were taken from Eurobarometer website for the best available year (closest to 2017). Since all the proxy indicators are expressed in percentage terms there is no need to bring them to single scale; they all are commensurable.

[3] Considering European Commission DG-s and services as separate bodies and omitting purely administrative ones.

[4] Some bodies can execute powers in more than one utility component.

[5] It should be noted, however, that this method can be used only in international unions of high integration level where quite a few common supranational bodies have been created.

[6] Again, for discussion on this issues refer to [9].

Table 1

Calculation of weight coefficients for utility components in the EU using institutional approach

Bodies*	Utility component				
	Economic	Socioeconomic	Security	Political	Ecological
Decentralized Agencies					
Agency for the Cooperation of Energy Regulators (ACER)		1	1		
Body of European Regulators for Electronic Communications (BEREC)		1			
Community Plant Variety Office (CPVO)	1				
European Agency for Safety and Health at Work (EU-OSHA)		1			
European Agency for the Management of Operational Cooperation at the External Borders (FRONTEX)			1		
European Agency for the operational management of large-scale IT systems in the area of freedom, security and justice (IT Agency)		1	1		
European Asylum Support Office (EASO)			1	1	
European Aviation Safety Agency (EASA)		1	1		
European Banking Authority (EBA)	1				
European Centre for Disease Prevention and Control (ECDC)		1	1		
European Centre for the Development of Vocational Training (Cedefop)	1	1			
European Chemicals Agency (ECHA)		1			1
European Environment Agency (EEA)					1
European Fisheries Control Agency (EFCA)					1
European Food Safety Authority (EFSA)		1			
European Foundation for the Improvement of Living and Working Conditions (EUROFOUND)		1			
European GNSS Agency (GSA)	1	1	1		
European Institute for Gender Equality (EIGE)		1			
European Insurance and Occupational Pensions Authority (EIOPA)	1	1			
European Maritime Safety Agency (EMSA)					1
European Medicines Agency (EMA)	1	1			
European Monitoring Centre for Drugs and Drug Addiction (EMCDDA)		1			
European Network and Information Security Agency (ENISA)	1	1	1		
European Police College (CEPOL)		1	1		
European Police Office (EUROPOL)		1	1		
European Railway Agency (ERA)	1	1			
European Securities and Markets Authority (ESMA)	1				
European Training Foundation (ETF)	1	1			
European Union Agency for Fundamental Rights (FRA)		1			
Office for Harmonization in the Internal Market (OHIM)	1				
The European Union's Judicial Cooperation Unit (EUROJUST)		1			
European Defense Agency (EDA)			1		
European Union Institute for Security Studies (EUISS)			1		
European Union Satellite Centre (EUSC)			1		
Executive agencies					
Education, Audiovisual and Culture Executive Agency (EACEA)		1			
European Research Council Executive Agency (ERC Executive Agency)	1				
Executive Agency for Competitiveness and Innovation (EACI)	1	1			
Executive Agency for Health and Consumers (EAHC)		1			
Research Executive Agency (REA)	1	1			
Trans-European Transport Network Executive Agency (TEN-T EA)	1	1			

End of the table 1

Bodies*	Utility component				
	Economic	Socioeconomic	Security	Political	Ecological
EURATOM bodies					
EURATOM Supply Agency (ESA)	1		1		
European Joint Undertaking for ITER and the Development of Fusion Energy	1				
European Commission Departments**					
Agriculture and Rural Development (AGRI)	1	1			1
Climate Action (CLIMA)					1
Communications Networks, Content and Technology (CNECT)	1	1			
Competition (COMP)	1	1			
Economic and Financial Affairs (ECFIN)	1				
Education and Culture (EAC)	1	1			
Employment, Social Affairs and Inclusion (EMPL)	1	1			
Energy (ENER)	1	1	1		
Enlargement (ELARG)				1	
Enterprise and Industry (ENTR)	1				
Environment (ENV)					1
EuropeAid Development & Cooperation (DEVCO)				1	
Health and Consumers (SANCO)		1			
Home Affairs (HOME)		1	1		
Humanitarian Aid (ECHO)				1	
Internal Market and Services (MARKT)	1	1			
Joint Research Centre (JRC)	1	1			
Justice (JUST)		1			
Maritime Affairs and Fisheries (MARE)	1	1			1
Mobility and Transport (MOVE)	1	1			
Regional Policy (REGIO)	1	1			
Research and Innovation (RTD)					
Service for Foreign Policy Instruments (FPI)				1	
Trade (TRADE)	1	1		1	
Other bodies					
European External Action Service (EEAS)			1	1	
European Institute of Innovation and Technology (EIT)	1	1			
European Investment Bank (EIB) and European Investment Fund (EIF)	1				
European Council				1	
European Parliament				1	
Council of the EU				1	
EU Court of Justice				1	
European Economic and Social Committee				1	
Committee of the Regions				1	
European Employment Service (EURES)	1	1			
European Central Bank (ECB)	1				
Number of bodies in the utility component (total 117)	35	44	17	13	8
Percentage in total	29,9	37,7	14,5	11,1	6,8
Estimated weight coefficient	0,299	0,376	0,145	0,111	0,068

Notes: *EU institutions and other bodies (http://europa.eu/about-eu/institutions-bodies/index_en.htm) and About European Commission / Departments and Services (http://ec.europa.eu/about/ds_en.htm).

**Only operational departments have been taken into account. Departments playing mainly administrative functions (like DG for Budget, DG for Translation, DG for Communication or Eurostat) were omitted.

Obtained in this way compositeindexes ofintegrationutility for the EU Member States actual for 2011 as well as initial data used for calculations are presented in *table 2*.

Theoretically the indexes could range from 1 to 100. Close to 100 values mean that the country receives maximum possible utility on all five integration utility components.

Table 2

Composite indexes of integration utility of the EU Member States and Initial Dataset

Country	*En* (Intra Export in Total 2008-'17 Average, %)	*SE* (Survey – EU membership is a good thing 2016, %)	*Sr* (Survey – «For» Common Security Policy 2016, %)	*Pl* (Survey – «For» Common Foreign Policy 2012, %)	*El* (Survey – EU – Positive for Protecting Environment 2017, %)	Composite index of integration utility (R)
Belgium	71,1	65	85	69	68	70,4
Bulgaria	65,2	48	80	74	48	60,7
Czech Republic	79,6	31	78	53	62	56,9
Denmark	57,0	55	66	45	58	56,3
Germany	56,8	54	78	72	61	60,8
Estonia	69,7	49	84	70	66	63,8
Ireland	61,0	63	43	60	48	58,1
Greece	56,4	38	77	75	51	54,2
Spain	69,4	55	76	67	45	63,0
France	57,0	46	76	57	60	55,8
Italy	57,3	41	69	62	36	51,9
Cyprus	63,1	37	86	72	58	57,2
Latvia	58,3	25	79	68	41	48,7
Lithuania	59,8	49	83	71	53	59,9
Luxembourg	79,0	72	81	62	67	73,9
Hungary	72,8	32	68	66	58	55,0
Malta	58,2	42	64	48	55	51,6
Netherlands	68,6	68	73	55	65	67,3
Austria	73,5	37	60	60	35	53,7
Poland	75,2	53	77	69	64	65,7
Portugal	73,9	39	66	60	28	54,9
Romania	73,5	57	74	67	50	65,0
Slovenia	69,9	39	77	72	60	58,9
Slovakia	81,3	52	88	81	49	69,0
Finland	47,2	47	57	44	64	49,3
Sweden	54,3	56	55	39	60	53,7
United Kingdom	46,2	26	52	37	41	38,1

Source: own calculations based on [10; 11].

As one can see integration utility indexes vary significantly among the Member States (variation coefficient exceeds 13 %). United Kingdom, Latvia and Finland get the level of integration utility that is less than 50 % from theoretically possible one. Top-3 is Luxembourg, Belgium and Slovakia (about 70 %).

Conclusion. Calculated above compositeindexes ofintegrationutility can have political application. Besides serving as arguments in political debates in the EU legislative bodies while negotiating the Union programs and initiatives they can be used to build up a «fair» system of budgetary contributions in the EU. It can be achieved by linking the amounts of resources that Member States contribute to the common budget to the integration utility values. This utility-based mechanism will increase the efficiency, political and financial sustainability of the whole EU budgetary system.

Moreover the lowest indexes of integration utility can be interpreted as signals about the EU nations with the least willingness to stay in the Union and can be expected to challenge their membership in it in the future. The recent Brexit case doesn't seem so surprising in the light of our calculations.

We realize that some techniques suggested in this paper are debatable and should become a subject for further scientific developments. The most vulnerable parts of the proposed methodology arethe proxies used to describe the utility components and the weight coefficients presented in equation (2).

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Бояр А. Відмінності в інтеграційній корисності держав-членів Європейського Союзу.

Постановка проблеми. *Міжнародна інтеграція в останні десятиріччя розвивається небувалими темпами в усіх мегарегіонах світу. Цей процес є невідворотним і майже усі країни втягнуті у нього. Саме тому питання міжнародної інтеграції є актуальними і цікавими з когнітивної точки зору, особливо коли йдеться про наслідки та ефекти певного наднаціонального інтеграційного проєкту для його держав-членів.*

Аналіз останніх досліджень і публікацій *показав, що інтеграційна корисність є категорією, яка використовується в поодиноких наукових дослідженнях як детермінант поведінки держав-членів у певному інтеграційному об'єднанні. Однак не виявлено праць, в яких досліджувалась би корисність держав від їх участі в певному інтеграційному проєкті.*

Мета *статті – розроблення можливої методики оцінки інтеграційної корисності держав від їх участі у певному інтеграційному об'єднанні та апробація цієї методики на прикладі Європейського Союзу.*

Матеріали та методи. *Питання методики оцінки інтеграційної корисності є складним і малодослідженим у вітчизняній та закордонній науковій літературі. З кількох гіпотетично можливих підходів до такої оцінки обрано індексний метод, суть якого полягає у розрахунку за 100-бальною шкалою індексного показника інтеграційної корисності, який складається з п'яти компонентів корисності: економічної, соціоекономічної, безпекової, політичної та екологічної. Вагові коефіцієнти кожного з компонентів розраховуються за кількістю інституціональних структур, які забезпечують реалізацію співробітництва у відповідних сферах.*

Результати дослідження. *Розраховані таким чином інтегральні індекси інтеграційної корисності демонструють суттєві розбіжності держав-членів ЄС за вигодами від інтеграції у 2017 р. Виявлено, що Люксембург, Бельгія, Словаччина і Нідерланди належать до держав, які одержують найбільшу корисність, у той час як Великобританії, Латвії, Фінляндії і Мальті притаманні найменші значення відповідних показників.*

Висновки. *Диференціація держав-членів інтеграційного об'єднання за рівнями корисності від свого членства в ньому є цікавою не лише у когнітивному плані, а й у практичному. Зокрема така інформація може використовуватися представниками держав з низькими показниками інтеграційної корисності під час ведення політичних «торгів» щодо своєї участі (зокрема фінансової) у наднаціональних програмах та ініціативах об'єднання.*

Показники інтеграційної корисності можуть слугувати основою для побудови справедливої схеми внесків до спільного бюджету об'єднання, коли більші платежі здійснюють держави-члени з найбільшими здобутками, що посилить політичну та фінансову стабільність інтеграційного об'єднання.

Крім цього, країни з найнижчими показниками інтеграційної корисності можна позиціонувати як такі, що мають найменше бажання залишатись у складі об'єднання і можуть у майбутньому поставити під сумнів своє членство. Нещодавній Брекзит не виглядає несподіваним у контексті проведених у цій статті розрахунків.

Ключові слова: інтеграція, корисність, інтеграційне об'єднання, держава-член, Європейський Союз, індекс, вигода.